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General Articles

THE HABITS AND GENERAL MANAGEMENT OF ANIMALS WHICH ARE BRED FOR FUR IN GREAT BRITAIN*

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Civilisation has made such deep inroads upon the natural habitats of wild fur-bearing animals that their numbers have diminished, almost to the point of extermination of some species; trappers have been forced to penetrate further into the wilds of the north; the supply of good quality pelts from natural sources has fallen, but the demands of the trade have increased. In brief, this increased demand and reduced supply are the cause of the farming or domestication of the wild fur-bearing animals. Fur farming on a large scale has been established in Canada, U.S.A., Norway, Germany and Russia, and during the past 15 years an enterprising industry has grown up in Great Britain. The first point to emphasise is that fur-farming, which has come to stay in our country, is rapidly becoming, if it has not already become, the main source of supply of the world's fur trade, the centre of which is the City of London.

For some five or six years I have been in touch with members of this new animal-industry and I have been watching with admiration the way it is building up a system of feeding, housing and breeding. Though it is empirical, the system works with a measure of success sufficient to merit the close co-operation of science. The help of science is needed because relatively little is known of the anatomy, physiology and pathology of these animals; and here let me caution you that each animal has its individual characteristics and that generalisations in our present state of ignorance are unwise and may be misleading. But I am convinced that the progress of the industry is intimately bound up with the intelligent application of scientific principles of management in health and in disease. Will this guidance be given and which institution in Great Britain is best qualified to give it? I suggest that it is the special responsibility of our schools and our own laboratories to acquire the knowledge and means for assisting the general practitioner to give this service.

* Paper presented in opening a discussion on "The Fur-bearing Animals bred for commerce in Great Britain," by the Central Veterinary Society, May 3rd, 1934.

Varieties of Fur-bearing Animals

As a preface to your discussion I have endeavoured to summarise the knowledge obtained by the pioneer farmers during the past two decades. The farming of some, *e.g.*, the fox, mink, marten, fitch and nutria, may be regarded as firmly established in Great Britain; but I shall describe other animals with which some farmers are experimenting. The rabbit industry, most important and well organised, will also receive mention.

(1) The Fox [Natural Order—Carnivora].—We are not concerned in this discussion with our wild royal or red fox of Great Britain. The commercial fox derives from the wild red fox of North America, which has a surface colouring of red on the upper parts and sides and of white on the throat, breast and belly; its underfur is very dark, almost black, on the upper-parts and dusky-grey on the under-parts; there are restricted black markings on the feet and ears, a white tip of the tail and white barred hairs on the back and rump. Three colour mutations of this North American red fox are required by the trade, *viz.*, the silver, blue and cross. For some years a fourth mutation, the black fox, was farmed in Canada, but I understand that owing to the ease with which pelts were dyed black this variety has lost its former trade value. A white mutant is occasionally trapped in the wild (see fig. 1).

Fig. 1.—A white mutation of the North American fox (not an albino), caught in the wild state in Alaska; now in the Cowichan Ranch, near Canterbury, Kent.

In the silver fox black replaces the red of the North American red fox. This is the most popular variety at present among British farmers (see fig. 2); the market value of its pelt varies according to quality from £7 to £25 each. A stud book, in which all silvers born in

this country since 1925 are registered, is kept by the Silver Fox Breeders' Association, which promotes the interests of the owners of about 90 silver fox farms varying in size from 3 to 150 breeding pairs. A good quality breeding pair costs from £90 to £125.

Fig. 2.—Silver Fox dog showing markings of the pelt and position of the tape-muzzle.

The colour of the blue fox is a slate-grey or, less commonly, a blue-brown grey, and frequently there is a silvery ticking over the back (see fig. 3). It was introduced into Great Britain from Canada in 1929, and last year there were over 250 blue foxes on British farms.

Fig. 3.—An adult Blue Fox dog.

The cross fox derives its name from a cross of black fur, of which one arm extends along the mid-line of the neck and back, while the other arm passes over the shoulders and down the forelegs (see fig. 4). The more silver or black and the less red or yellowish colouring of the upper-parts the more valuable is the pelt of the cross fox.

Fig. 4.—A Cross Fox vixen; part of the horizontal limb of the black cross is seen passing down the right shoulder.

The interests of owners of blue and cross foxes and of all other kinds of small fur-bearing animals except the rabbit and silver fox are promoted by the British Fur Breeders' Association.

Foxes are mated in February or March; œstrus, which occurs only once per annum and lasts from a few hours to two or three days, is characterised by a brownish discharge *per vulvam* (see table). Vixens will breed at eleven months of age. Blue foxes appear to be more prolific than other varieties, their litters varying from 6 to 12 cubs, whereas the silver produces 1 to 9 with an average of four cubs. It is widely accepted that the best breeding results follow the running of one dog to one vixen only. Vixens which prove barren for two successive seasons, frequently breed to a different dog; some vixens after several seasons with large litters will not come into œstrum, they merely require a rest. The mean duration of reproductive life of the fox is about ten years.

"The excitable disposition of foxes is one of their most troublesome characteristics" (Dearborn). Strangers or unusual sounds and smells readily upset them and may cause vixens to refuse the dog, to abort or to kill their young. Occasional foxes with constant handling for the show bench become as docile as a pet dog—at least in their owner's hands, but the generality of foxes are wild animals despite their birth in captivity. Thus the visiting veterinary surgeon would be wise to persuade the owner to handle the animal due for professional attention and to see that its jaws are securely tied by the tape-muzzle as ordinarily used for our canine patients (see fig. 2). Strong leather gloves

should be worn until the tape-muzzle has been fixed. For catching adult foxes farmers customarily seize the neck in the circular jaws of a pair of long-handled tongs. Wooden "handling-boxes," into which a fur-animal is driven from its kennel, are widely used on fur farms, but in my experience they are most unsatisfactory for examination of a diseased or injured animal.

The timidity and excitability of the vixen at and after cubbing impose restraint upon the breeder. Her behaviour will show the observant farmer how her cubs are faring; he refrains from peering into their dens, which upsets most vixens with disastrous results to the cubs. Unless they need some special attention the cubs should not be handled until they are weaned, about six to eight weeks of age, when they will be eating solid food. A cat makes a successful foster-mother for two cubs until they are three weeks old, at which age they should be removed for rearing by hand since their teeth are then large and sharp enough to injure the cat's nipples and glands.

In the wild state the fox is a predatory carnivore, eating the flesh, bones and offal of its prey, eggs, insects and various berries. Under domestication adults are commonly fed twice daily; meat in the morning, milk and cereals in the evening. The meat, *e.g.*, horse, beef, rabbit, poultry, fish, liver, tripe, bone and bone meal, is raw or cooked. Fresh milk is given with a cooked porridge made of wheat flour, rolled oats, oatmeal, bread or rice. Cereals are also fed as biscuits or combined with meat as in the trade biscuit. Vegetables and fruit, preferably in the raw state, are mixed with the meat ration. Milk and eggs are commonly given to vixens with cubs. During the summer the meat ration is usually reduced but in autumn those foxes required for pelting are generously fattened for the production of good quality fur. Liberal quantities of fresh water should be provided at least once daily.

I wish to draw your attention to two common practices in feeding foxes, with which I disagree. Many breeders do not give meat to their cubs under four months of age. I suggest that the cubs require meat and bone to prevent deficiency disease and to aid the development of the teeth. Secondly, it is a common practice to put vixens on short keep during the summer and autumn, and to feed them generously with cereals and milk from January onwards, in preparation for breeding. I have had occasion to advise several farmers to revise this method and to keep their vixens lean during pregnancy so as to avoid pregnancy toxæmia, which I have found at autopsy; otherwise to keep them on a standard maintenance diet. Two other facts should not escape our attention. To prevent injuries and obstructions of the alimentary tract by bones, farmers of all the carnivorous fur animals are well advised to pass fish through the mincing machine, but I do not support the prevalent practice of mincing other flesh foods. Influenced by the type of advertisements, with which we are only too familiar, many farmers are beginning to experiment with cod-liver oil, inorganic salts and other proprietary chemical food preparations. I do hope our veterinary dieticians will take up this very important problem without delay; their advice is needed and will be welcomed by fur breeders. Our dieticians may permit me to remind them that the criteria of the fur farmer differ in many respects from those of a zoological society.

The Weasel Family or Mustelidæ [Natural Order—Carnivora].

(2) Ermine is the smallest of the weasel family, about 10 inches overall length. The species, which is trapped for its winter coat of white fur with a black tip on the tail, is ***Putorius vulgaris*** of North America. Its summer coat is brown, tinted with red like that of the European ermine or stoat, ***Putorius erminea***, which is 14 inches overall length. The ermine is a killer of wild birds, poultry, rabbits, small rodents and frogs. I understand that attempts to breed this animal in captivity are being made in America but I have not heard of its introduction into Great Britain.

(3) Mink is a larger member of the weasel family, measuring about 23 to 24 inches overall length; the dogs are slightly larger than the bitches (see fig. 5). It carries a thick dark-brown fur with a white chin and usually small patches of light brown or white hairs on the belly. Its coat changes about May and October.

Fig. 5.—A dog Mink.

In the wild state in North America, Siberia, Mongolia and Japan, mink prey on fresh-water fish and vary their diet with frogs, snakes, small rodents, rabbits, poultry and wild birds. In Great Britain farmers feed twice daily; 2 oz. of a mash composed of a cereal, vegetable and dried meat are given in the morning and in the evening 1½ to 2 oz. of raw fish or lean meat. In America it is a common practice to fast those mink which are in good condition, for one day in every ten.

Nest boxes quickly become fouled by fæces, which are deposited in one corner; and to this identical corner mink customarily carry the whole or greater part of the ration. I was led to conclude that this defilement was the origin of outbreaks of paratyphoid enteritis (salmonellosis) which I have investigated on two mink farms and I advised daily cleansing and disinfection of the nest boxes. A difficulty in overcoming this insanitary habit is experienced at and after parturition. If the bitch is disturbed at this period she may destroy her litter. It is unwise to examine the nest until the kittens are at least four to five weeks old, when they commence eating solid food. Many farmers advise no disturbance of the litter until the kittens are weaned at about the eighth to ninth week. Mink attain maturity about their fifth month.

(4) Fitch. This term is applied by the trade to the pelt of the European polecat, *Mustela putorius* (see fig. 6), of which three varieties, the German, Austrian and Russian, are farmed in this country. The name is derived from *fitchet* or *fitcher*, by which the polecat has long been known in many parts of Great Britain.

Fig. 6.—The Fitch or European polecat.

Owing to the fœtid smell of the secretion of its anal sebaceous glands, the polecat has also been termed the *foumart* or *foul-marten*. The fitch resembles the mink in size and shape, being about 23 to 24 inches overall length. By long breeding in captivity the wild polecat has been modified into the ferret, of which there are two common varieties, the yellowish-white with pink eyes and the brown or "polecat-ferret." The ferret is slightly smaller and of more slender build than the three varieties of fitch farmed for their dense, silky, warm fur. The B.F.B.A.'s standard for the pelt is a yellow (light fitch) or champagne (dark fitch), each "with good black lines down the back shading off on the rump; white star on breast not to be excessively large."

In the wild state the polecat is a nocturnal feeder, preying on rabbits, hares, ground game, poultry, eggs, lizards, frogs and snakes. Under domestication fitch are fed twice daily on the raw flesh of freshly killed rabbits, rats, poultry or horse; fresh fish is also given. Salted or preserved flesh must not be fed to fur animals. Fresh vegetables or fruit are incorporated in the diet at least once per week.

Fitch resemble mink in their habits of using the nest box as a latrine and dining room and of their dislike of any interference at and after parturition. The bitch should not be disturbed until her kittens' eyes have opened, *i.e.*, at the end of the second week. The young are weaned about the sixth week. The best way of lifting members of the weasel family from their pens or boxes is to hold them firmly by encircling the neck with thumb and forefingers. To obtain this hold on a savage animal it may be necessary first to grip its tail with the left hand and lift it until its fore feet clutch onto some fixture of the pen; then throw it a piece of raw meat; when its teeth are firmly fixed in the meat, grip its neck with the right hand and lift it out.

(5) Marten.—Two species are farmed for pelts, the American or baum marten, *Mustela americana*, and the European or stone marten, *Mustela foina*; the best specimens of the latter come from Sweden, Hungary, Turkey and Spain. The marten has a dull grey fur with brown guard hairs and a large spot on the throat; this spot is white in the stone marten and yellow in the baum marten. A mature marten is about 30 inches overall length; its head is fox-like and it has a slender body with short legs like the mink.

In the wild state the marten feeds on small rodents, rabbits, hares, squirrels, birds, eggs, frogs, insects, honey and fruit. In captivity it is successfully reared on fresh meat, poultry, live mice and rats, table scraps, fresh and stewed fruit, nuts, cedar cones, eggs, and bread and milk. A mixed ration of fruit and meat, five to six ounces, is divided into morning and evening feeds.

As advised for mink and fitch, the bitch marten should not be disturbed at and after parturition. Her young remain blind until about the fourth week and come onto meat diet about the eighth week. Preferably the young should not be disturbed until they leave the nest. From the table it will be observed that the mating season occurs in the summer, between July 2nd and August 12th, during which the bitch may have two œstral periods at an interval of seven to 14 days. The long gestation period requires special notice; its first stage takes place during the autumn and its further development is delayed during the winter to be continued in the early spring and completed in April or the beginning of May—a total of 259 to 275 days.

Martens of either sex are quarrelsome and ferocious fighters and individuals should be kept in separate pens.

(6) Fisher (*Mustela pennanti*).—This North American cousin of the mink and marten is farmed in Canada, but I have no record of its introduction into Great Britain. The origin of its name is unknown; it shows no liking for fish, neither does it frequent water. It is also known in America as Pennant's marten, black marten, cat marten and pekau. An adult fisher is a sturdy fierce animal, weighing 20 to 25 lbs., with an overall length of 38 to 42 inches. It will attack any dog at sight and with its own species it fights to the death. The colour of its pelt is a very dark brown or black. In captivity an adult requires about 16 ozs. of food per day, of which 80 per cent. should be lean meat, *e.g.*, horse, beef, rabbit, mice, tripe, liver and bones, to which table scraps, bread, cereals, milk and fruit may be added. Its mating season is in spring and its gestation period is almost equal to the marten's. The young are weaned about the twelfth week.

(7) Skunk (*Mephitis* species).—The skunk of North and Central America is farmed in Canada and U.S.A. and I understand that some breeding experiments are being conducted in Great Britain, though the animal has not been registered by the B.F.B.A. It has a black fur with varying amounts of white and an overall length of 30 to 32 inches. In the wild, it is nocturnal and preys on birds and insects; it also eats vegetation. In captivity its dietary resembles that of the fisher. Like other members of the weasel family it is very apt to gorge its food; also the female resents any disturbance when with young. Canadian farmers remove the two scent glands of the young when they are about four to five weeks old; these glands, like the anal sebaceous glands of the dog, are on either side of the anus. For this operation, which I understand is performed without an anæsthetic, the skunk is lifted by the tail, wrapped in a sack and held between the operator's knees as in the castration of cats.

(8) Racoon.—The black racoon (*Procyon lotor*) is farmed in Great Britain. It " is a very playful animal, non-vicious and adjusts itself readily to a new environment. It is extremely clean living, especially with food—often washing it before eating. The natural inquisitiveness, combined with generally good temperament, makes the care of these animals very easy " (B.F.B.A. Handbook, 1933). It has a jet black fur on the back and light markings on the face; weighs 10 to 20 lbs. and has an overall length of about 36 inches. In the wild, racoons frequent the margins of streams, hunting for fish and molluscs in the shallow water. The racoon is fed once daily in the evening as it sleeps during the greater part of the day; females with young are given morning and evening feeds. Cereals, bread and vegetables with gravy form the principal dietary; raw and cooked meat, milk and eggs are also given. It requires an abundance of fresh water. It should be generously fed during October and November since it hibernates throughout December and January. The whelps are blind until the fourth week and are weaned about the tenth week.

(9) Nutria [Natural Order—Rodentia].—The name of this large South American aquatic rodent is the Spanish for an otter. The nutria, *Myopotamus coypus*, is also known as the coypu, the swamp beaver and the castor de Chile (see Fig. 7). In its natural habitats it burrows into the banks of the lakes and rivers which flow east and west from the Andes through Chile and Argentina. Despite its subtropical origin the nutria has been readily acclimatised to Europe since 1926, where it is being farmed on an ever increasing scale. It is reported that in Germany there are some 200 nutria farms and its popularity among British farmers is growing.

Fig. 7.—The Nutria.

The nutria, which resembles a giant rat, has an overall length of about 33 to 34 inches. The toes of its hind feet are webbed and its tail, about nine to ten inches long, is scaly and covered with bushy hairs. The colour of the pelt is a speckled yellowish-brown with lighter underparts, where the fur is especially thick and soft. Nutria are prolific breeders and will produce five litters within two years. Old males and females are apt to be quarrelsome during the breeding season and severe injuries may be inflicted by the massive orange coloured incisor teeth. The mammary glands are situated on either side of the mid-line of the female's back; thus the suckling of the young may continue while the family is afloat. The whelps will take to the water on the day of birth.

Nutria are vegetarians with massive appetites and in captivity their diet resembles that of the rabbit, *e.g.*, fresh vegetables, apples, pears dry bread and occasionally a little mixed corn. Morning and evening feeds are recommended Nutria are caught and lifted by the tail, though they should be handled and disturbed as little as possible.

(10) Muskrat [Natural Order—Rodentia].—Some years ago the muskrat or musquash, *Fiber*

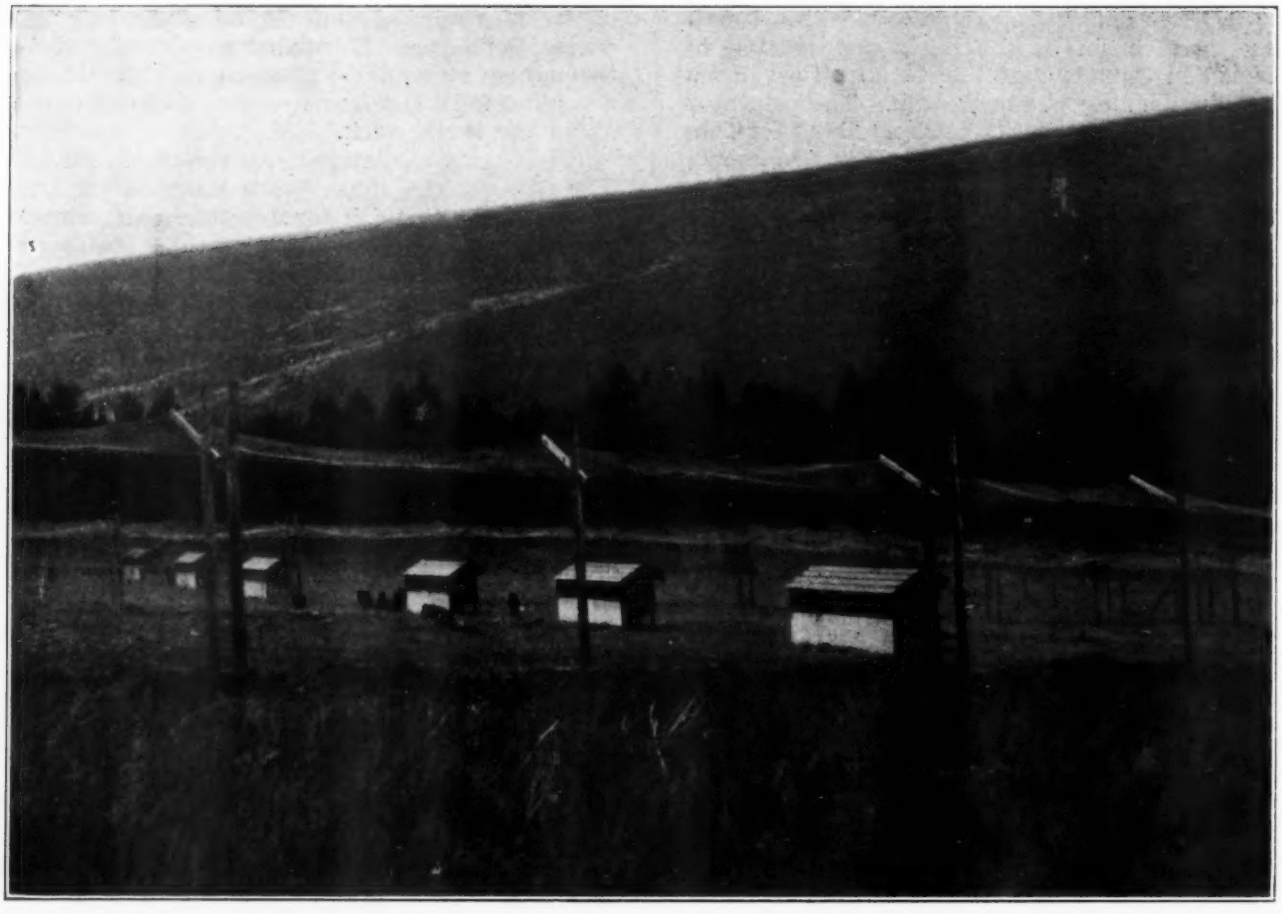

Fig. 8.—A turf compound about one acre in area, which is divided into large pens. Note the guard-fence with an internal overhang at the top.

Fig 9.—Part of the Shire Silver Fox Farm, Breck, Ayrshire. Note the guard-fence of the compound in the foreground, also the tunnels leading from the kennels into the runs. Its hygienic principles are satisfactory.

zibethicus, was introduced for fur farming into England from North America. Disagreeable consequences have followed the escape and multiplication of some of these rodents. The import and keeping of muskrats in Great Britain has been prohibited under the Destructive Imported Animals Act, 1932.

(11) Rabbit [Natural Order—Rodentia].—Rabbit farming is the oldest and largest section of our fur-animal industry. It is estimated that 850,000 rabbits are fed in Great Britain for their wool, pelts or meat, or purely for " fancy " purposes. To do justice to the subject and to our profession a whole evening is required for discussion of the rabbit alone and I would suggest that we might defer consideration of rabbit farming to another meeting.

The Housing of Fur Animals

The essential units of a fur farm are (1) the compounds, (2) the buildings for food store, kitchen, equipment store and pelting shed, (3) isolation or hospital pens and (4) manure receptacle. Each compound is surrounded by a strong wire guard-fence, having an internal overhang at the top and an inturn on the ground level, which will prevent escape from within and intrusion from without. Within the guard-fence a compound consists of gangways around a series of pens or enclosures, which vary in size according as they are used for breeding pairs, single unmated animals or collections of growing cubs.

The construction of fox farms is still in the experimental stage; innovations are constantly being made and discussed in the fur-farmer's press. But it is possible to distinguish three principal types of pens. Firstly, the pens having a turf-floor may be fixed or movable. The tendency has been to reduce more and more the area of the fixed open pens; for example, earlier models provided a breeding pair with 2,000 to 2.500 square feet, in which adequate running and jumping exercise could be taken and shelter from sunshine and rain, by means of trees, barrels or boxes, could be found. These large pens are surrounded by a nine to ten feet fence of 1½ inch mesh wire netting, 14 to 16 gauge. To prevent digging the wire is either buried to a depth of four to five feet in soft non-clay soil or turned inwards over the ground surface for some three feet. At least one inside overhang of 18 inches is provided at the top and sometimes a second overhang is made about halfway up the fence (see Fig. 8).

These large fixed pens are not built so frequently to-day as the movable models, which provide a breeding pair of foxes with some 180 to 216 square feet of run on turf. The small movable pen has the advantage of reducing the

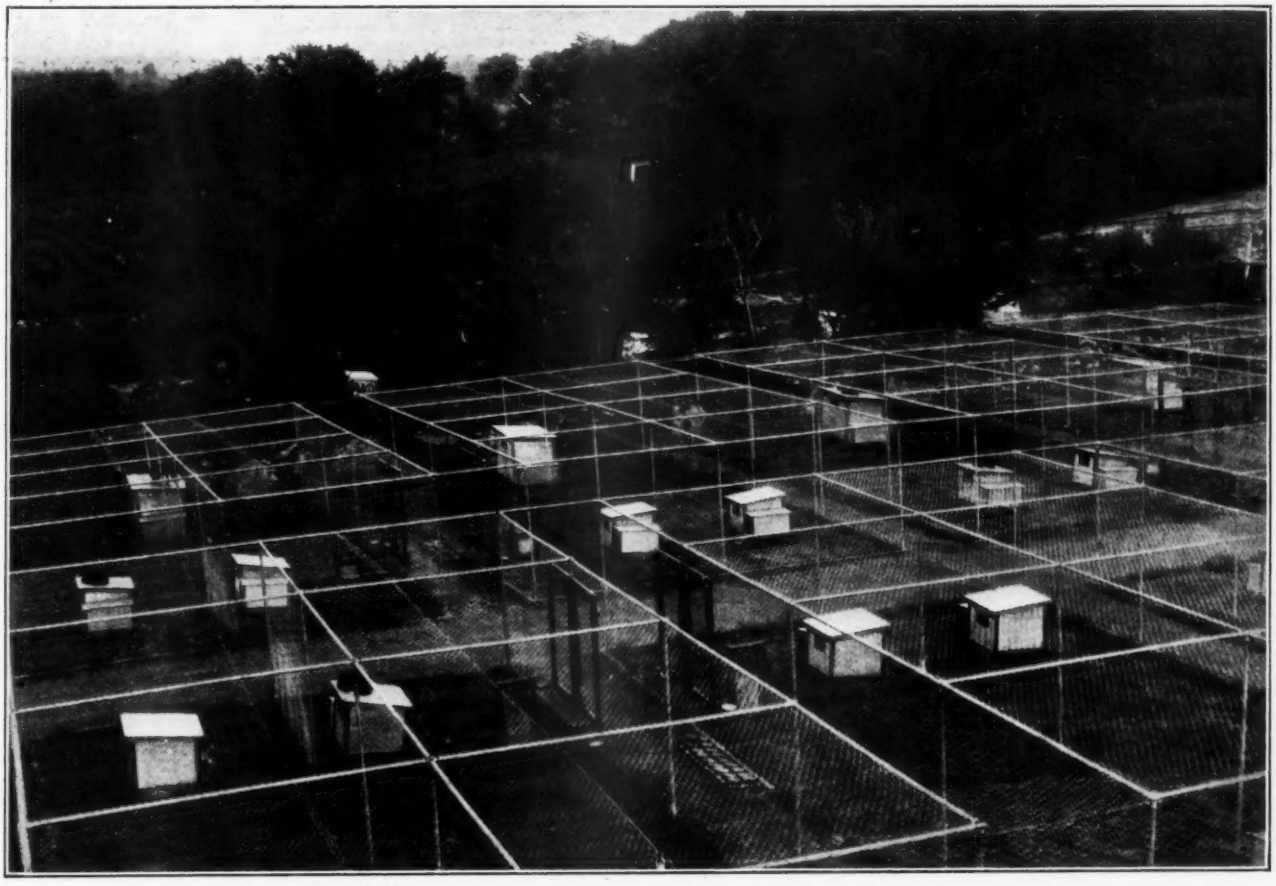

Fig. 10.—Part of a compound in a recently constructed fox farm. Secure, neat and compact, but hygienically unsatisfactory.

incidence of parasitic infestations and the disadvantage of reduced opportunities for strenuous exercise. Of course building costs are another important consideration; for example, the cost of erecting a unit of five small movable pens is estimated at £300. These smaller pens are wired-in over top and sides (see figs. 9 and 10).

A second type of pen, which offers facilities for cleansing and thus for the prevention of disease, has wire-netting roof and sides and a wooden floor. The floor has an area of about 216 square feet and is raised off the ground (see Fig. 11).

Fig. 11.—Part of a fox compound showing movable pens with wooden floors.

Thirdly, experiments are being made with an all wire-netting raised pen or cage, *i.e.*, wire netting roof, walls and floor. The notion of the inventor is that the fæces of worm-infested foxes are dropped through the wire floor and collected at intervals from the ground beneath.

An ingenious method of providing strenuous exercise to foxes in small pens has been described by Mr. E. H. Ireland in Fur Farming, 1933, November, p. 26. He installed a tread-wheel in his all-wire cages, and to the wheel be fixed a mileometer from which he learned that a fox will travel over 250 miles per week (see fig. 12).

Fig. 12.—An all-wire fox pen showing a fox taking exercise in the tread-wheel.

There are many types of den or kennel in which the fox sleeps and the litter is born and reared; one good model made by Pratten and Co., Ltd., of Midsomer Norton, Bath is illustrated (see fig. 13).

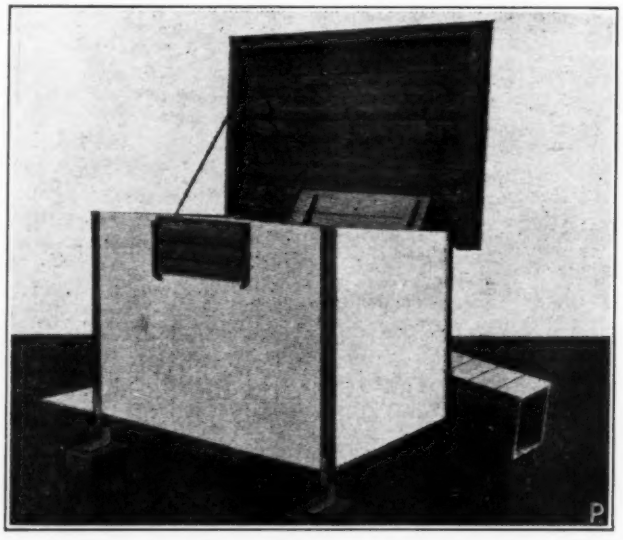

Fig. 13.—A fox breeding kennel made by Messrs. Pratten & Co., Ltd., Midsomer Norton, Bath.

The kennel may be inside the pen or it may communicate with the pen by means of a short tunnel (see fig. 9). Usually it is movable, constructed of wood, resistant to extremes of cold and heat, free from draughts and raised off the ground. The roof cover should be hinged or removable in order to facilitate inspection, cleansing and disinfection. Usually the interior is divided to form a nest which is raised above the wooden floor. The entrance hole, which should be provided with a trap-door, is about eight by ten inches and is cut about four inches above the floor level in order to confine the cubs during the first few weeks of their life. Usually

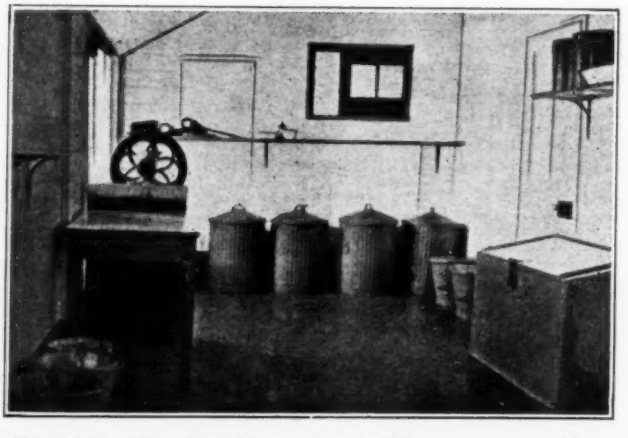

Fig. 14.—The interior of a kitchen on a modern fox farm. Note the mincing-machine, which is regarded by fur-farmers as an essential item of their equipment.

kennels are provided with an inspection trap which also serves as a ventilator. Straw bedding is only required during the cold weather. All surface drainage should lead from the kennel down to the further end of the pen.

Most of the farms for animals of the weasel family are constructed and equipped on the principles met with in fox farms. The following dimensions of the pens have been found suitable to the size and habits of the animals: 24 square feet for mink and fitch (see fig. 15), 48 square feet for marten, 192 square feet for fisher and 240 square feet for racoon.

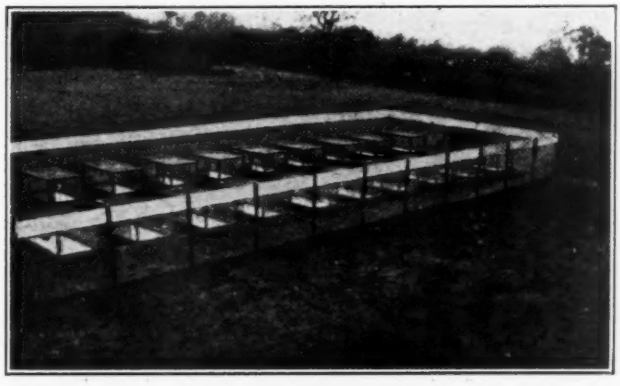

Fig. 15.—An open-air compound in a minkery; ten moveable pens on either side of a central gangway.

Some farms are constructed on the shed-principle, *i.e.*, a double-sloped roof covering a central gangway, from either side of which the kennels and wired pens extend outwards; a maximum of 30 pens, 15 on either side, is allotted to each shed (see fig. 16). On one fitch farm the breeding pens are arranged in tiers under an open-fronted shed, the flooring being of wood. A ¾-inch mesh wire-netting, 18 gauge, is required for these smaller carnivora.

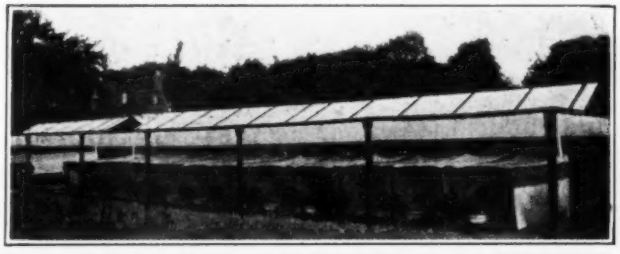

Fig. 16.—The pens on one side of a minkery. The kennels are fixtures, on either side of a central gangway of the shed.

The construction of accommodation for nutria has conformed to the habits of the animal in its wild state. A nutria readily climbs a wire-netting fence but its escape is prevented by a 9-12 inch overhang at the top; preferably the fence should slope inwards. The nutria will easily gnaw through a wire-netting fence, which for at least three feet up from the ground should be built of galvanised metal sheets. For the same

Fig. 17.—Part of a nutria farm showing pens opening into a running stream.

reason any woodwork should be protected by layers of strong wire netting. In the wild, nutria burrow deeply into the banks of streams; thus, to prevent their escape from the pens, the floor should be made of concrete or strong wire netting (not less than 15 gauge) should be laid beneath the soil level. A breeding pair requires a kennel leading into a pen of about 72 square feet which contains a swimming pool, five feet square and 18 inches deep. As running water is preferable to a bath, some farmers construct their pens on the bank of a stream in which enclosures of hurdles are built. These hurdles are composed of $\frac{3}{8}$ inch iron rods, set 1 to $1\frac{1}{2}$ inches apart and covered with wire netting (see figs. 17 and 18). Young growing nutria, the sexes having been separated, are housed in large compounds.

Fig. 18.—Part of another type of nutria pen which has been built on the bank of a stream; note the strong iron fencing.

Various Observations

I strongly advise any colleague who is called in to autopsy a fur animal, to request the farmer to remove the pelt after an external examination and before any incision is made in the carcase. A farmer sought to take legal action against me for damaging a pelt of a fox which he had sent for autopsy; fortunately I had previously advised him by letter that I accepted no responsibility for the return of or any damage to the fur. Usually farmers remove the pelt before sending the carcase to a laboratory; but they may not do so if they require the autopsy to be made on the farm.

The methods adopted by farmers for the destruction of animals required for pelting, should be discussed privately with individual farmers. Some methods are not satisfactory and I think breeders would welcome instruction in the use of the electric lethal apparatus or of chloroform.

As a preventive of climbing and digging, American fox farmers have been encouraged by the U.S.A. Fur Animal Experiment Station to lance " the branches of the deep flexor tendons in the front feet." " This operation has been performed. . . . for a number of years, but it is found that the utmost precaution must be taken not to sever the branches of the tendon too high, thereby causing lameness and a condition known in livestock as broken down pasterns." " One year after being operated upon, some of the animals have resumed their digging proclivities to a marked degree." I have abstracted these sentences from *Fur Farming* (1934, March, p. 7), for your information and with the hope that farmers in this country will not have been encouraged by their own journal to attempt this useless and cruel operation.

Finally, might I be excused for suggesting that the N.V.M.A., for their Edinburgh Congress, should arrange a visit to one of the very fine farms within easy reach of their meeting place. Possibly the council of this society might like to consider a visit to one or more of the large fur farms in Kent. I am given to understand that we should be heartily welcomed and I am sure we should benefit by the visit.

I acknowledge, with deep gratitude, the help given to me in many ways over a long period by Mr. Percy Miller, Secretary of the B.F.B.A., and for permission to reproduce, from his journal, all the photographs illustrating this paper.

Table Summarising Observations made on the Breeding of Fur-bearing Animals under Domestication.

Natural Order.	Animal.	Mating.	Breeding Season	Gestation Period (Days).	Number in Litter.	Number of Litters per annum.	Weaning, age of, (Weeks).	Puberty, age of, (Months).
Carnivora	Fox	1♂ to 1♀	Feb.-Mch.	50—55	1—12	1	6—8	10
,, ...	Mink	1♂ to 2 or 3♀	March	42—62	3— 9	1	8—9	10
,, ...	Fitch	1♂ to 2 or 3♀	Mch.-Apl.	42—45	3—12	2	6	10
,, ...	Marten	1♂ to 4 or 6♀	July-August	259—275	2— 6	1	8—9	4—5
,, ...	Fisher	1♂ to 1♀	Feb.-Mch.	350—355	2— 5	1	12	11—12
,, ...	Skunk	1♂ to 6♀	March	60—66	4—10	1	8—9	10
,, ...	Racoon	1♂ to 3 or 5♀	Feb.-Mch.	63—66	4— 6	1	10	12
Rodentia	Nutria	1♂ to 1♀	Any time	120	2— 9	2 to 3		6—7
,, ...	Rabbit	1♂ to 1♀	,,	30—33	5— 8	2 to 3		6—9

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Appendix

Handbooks, regulations for shows, addresses of farmers and general information upon the fur-animals may be obtained from:—

(1) The Silver Fox Breeders' Association of Great Britain and Ireland. Secretary—B. G. Arthur, Esq., M.B.E., 1, 2 and 3, Oxford Court, Cannon Street, London, E.C.4. The Eighth Annual Show for live silver foxes was held at Agricultural Hall, London, N.1, in November, 1933. Activities confined to the silver fox.

(2) The British Fur Breeders' Association. Hon. Secretary and Treasurer—Percy E. Miller, Esq., 83-85, Farringdon Street, London, E.C.4. Publishers of *Fur Farming*, a monthly journal devoted to interests of breeders of all fur-animals other than rabbits; price 6s. 3d. per annum, post free. Hold an annual show in London.

(3) The National Rabbit Council of Great Britain and the Dominions. Hon. Secretary—Dr. J. N. Pickard. Institute of Animal Genetics. King's Buildings, West Mains Road, Edinburgh.

(4) The British Fur Rabbit Society. Hon. Secretary—C. O. Sayers, Esq. Forest House, Mitcham, Surrey. Publishes an Annual Year Book and maintains an Information Bureau.

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FUR-BEARING ANIMALS: THEIR DISEASES AND TREATMENT*

HENRY GRAY, M.R.C.V.S.

The different varieties of fox, some species of mustelid, as the polecat (fitch), stoat (ermine), mink (kolinsky), martens, fishers, otters, skunks and racoons are susceptible to canine distemper and this disease they contract from the distemper virus is capable of being re-transmitted, mostly in a milder form, to the dog. I am, however, not aware that such mustelids as the castor or beaver, and the badger are susceptible to it. The former animals, when affected with the disease, show it in all the forms that are observed in the dog. As Major Dalling is going to speak on this malady in the various species I shall not make any further allusion to it.

Many of the feline species, whose pelts are sometimes used in furriery, like most of the larger felines are subject to cat distemper and usually manifest it in a similar manner to the domesticated species. Probably they are also prone to the infectious enteritis of the cat, which from long clinical experience I believe to be a different specific malady which is often confounded with feline distemper.

Foxes have a similar disease to canine typhus. The manifestations, lesions and *post-mortem* findings appear identical.

Whether the *enzoötic meningo-encephalitis* or *myelitis* that affects them at times is a complication of a secondary infection to distemper or a specific disease has not been satisfactorily elucidated. The symptoms and course are similar in all species. The rabbit, guinea-pig and other rodents also have a similar complaint. It has been proved by Puntoni and others that the distemper virus in dogs also invades the myelium of the brain and spinal cord, and, if so, I see no reason why this structure is not rendered a suitable soil for injurious micro-organisms to invade and set up other changes in it. What I do know from long clinical observation is that dogs suffering from distemper often manifest cerebro-spinal and other nervous symptoms, especially during its later stages or at a variable length of time after an apparent recovery from the primary malady.

Foxes, like dogs and other species, suffer from a gastro-enteritis, or hæmorrhagic septicæmia, which is probably only a complication of distemper, typhus, protozoal invasion—such as in the so-called jaundice or other infection.

Young foxes and other species are subject to *coliform dysentery*. The *Bacillus coli communis* is found in the blood, especially of the swollen and congested spleen, liver, mesenteric glands, stomach and intestine. There is usually an acute enteritis.

Paratyphoid in the form of an infectious gastro-enteritis is often encountered in young foxes, the mink, polecat and other mustelids. There may be a dysenteric diarrhœa with little or no rise of temperature. The liver and kidneys are swollen and the lungs congested. *Salmonella ærtrycke* of the Gärtner group or *B. breslau* is found in the blood and visceral organs.

In cases of some standing, complicated with broncho-pneumonia, and also disturbance of the nervous system, pleurisy, congestion or inflammation of the liver, nephritis, congestion of the spleen and other lesions may sometimes be observed. Metritis in parturient animals is occasionally witnessed.

Tuberculosis is not rare in the silver fox, mink, polecat, nutria and other fur-bearing animals.

Cancer is occasionally encountered in foxes. It may attack the kidneys, mesenteric and other glands and organs. It may also be witnessed

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in other species. Sometimes the new growths are cystic.

Weil's disease or leptospiral jaundice is far from rare in foxes, ferrets, polecat and other mustelids. Not every case is accompanied by jaundice nor is every outbreak with symptoms of jaundice due to leptospira. They may follow other protozoal infections in which the lesions are very similar.

Coccidia of various species invade the intestinal tract of foxes and in fact every class of animal. They are at times particularly capable of causing fatal enzoötics in the common mole.

Spirochæta are found in every class of animal in a normal state of health. Some species are observed setting up disease in the foxes, mustelids, nutria and other rats. They have a preference for the swollen kidney, liver or intestinal mucous membrane. Some have claimed that a certain species is the cause of typhus or the so-called Stuttgart malady.

The arsenobenzene series of synthetic drugs, as neosalvarsan, or stovarsol, cacodylate of soda and other spirillocides, if injected early, give good results in spirochætal and other protozoal diseases. Wellcome's serum is recommended for leptospiral jaundice in the dog, fox and other species.

Glanders has been observed in foxes fed on glandered horse-flesh. Fortunately in our country that disease does not now exist.

Anthrax occurs occasionally in confined and wild foxes fed on the raw flesh of cattle dead of the disease.

Rabies has been witnessed in wild foxes and the skunk.

Pneumonia and pleurisy are seen in every species of the fur-bearing animals. They generally occur as a complication of various general infections. Pleural effusion may accompany pneumonia or pleurisy.

The most fatal cases of pneumonia are associated with streptococcic or staphylococcic infection. Silver foxes and other fur-bearing animals are sometimes attacked with pulmonary parasites which usually set up bronchitis, broncho-pneumonia or even a chronic pneumonia.

Pericarditis and *valvular endocarditis* are not rare in any species. They are generally complications of pulmonary infections. The majority of old foxes, like old dogs, show valvular wart-like lesions.

Gastric ulcer, indigestion and other gastric or bowel complaints are not rarely encountered in the fox, mink and other mustelids.

Rickets occurs in young foxes about 2½ to 3½ months of age. It is due to lack of proper food. It is never seen in those fed absolutely on fresh raw flesh and bones.

Silver-foxes and other animals are often subject to cystic calculi and the consequent cystitis, often accompanied by bloody urine, especially when there has been obstruction in the urethra.

Perineal hernia, especially of the bladder, is known. Cystopexy should be adopted.

The period of gestation of the silver fox is said to be from 51-52 days. The vixen is just like the bitch, subject to the various forms of dystocia, to puerperal fever, endometritis, chronic catarrhal metritis, torsion of the uterus, uterine inertia, abortion. Prolapse of the vagina is also witnessed.

Artificial Insemination of Silver or black foxes is widely adopted in some countries, especially in Russia: *vide* the late Professor E. J. Ivanow's special article on the subject in *The Veterinary Journal,* 1923, May, pp. 164-173; his lecture on the *Artificial Insemination of Mammals*, delivered at Edinburgh, December, 1929, in *The Veterinary Record,* 1930, January 11th; *Artificial Insemination in the Bitch,* by Henry Gray, in *The Veterinary Record*, 1922, June 10th; *Marshall's Physiology of Reproduction* and Huish's "The Causes of and Remedy for Sterility in Mares, Cows, Sheep and Bitches."

Pneumonia in the newborn and *navel infection* are not rare in all species in confinement.

Cannibalism or *eating the young* and *self-mutilation* occur at times in every species. The latter is generally due to disturbance of the nervous system.

Prolapsus recti and *Simple* or *Complicated Intussusception* with prolapse of the intussuscepted bowel is occasionally seen in all species, especially when affected with distemper. *Simple intussusception* is also seen in gastro-enteritis complicating leptospiral jaundice. Enteropexy is the only reliable means of preventing a recurrence after replacing the bowel in its normal situation.

Silver-fox vixens are subject to mastitis often accompanied by a mammary abscess. Non-puerperal lactation is not rare.

Monstrosities or deformed young, especially due to inbreeding, are occasionally observed.

Wounds due to bites may become infected and set up suppuration or septic infection.

The *dentition* of the silver-fox is identical with that of the dog. Irregularities are rarer than in the last species. Tartar accumulations and pyorrhœa are frequent in animals not fed on tearing and crunching raw animal food. Giving of whole animals such as rabbits, rats and poultry once in 24 hours from the time of weaning keeps foxes, mustelids and other carnivora in the best of health; they do not require feeding on such foods more than once in 24 hours. Wild foxes and rabbits suckle their young only once in 24 hours and like other nocturnal feeders they feed only during dusk or after night has set in.

Erosion of the enamel is due to a dirty mouth when erupting the second teeth during distemper.

Cutting or shortening the canine teeth to prevent these animals biting or wounding their neighbours may be carried out with a strong pair of bone forceps. The rough apex may be smoothed with a small file.

Fractures are similar to those in the dog and they require similar treatment.

Excision of the anal glands is generally carried out on the skunk. It is better to perform this when the animal is about a month old, that is, if it is going to be kept as a pet. If only kept for its fur the operation is not necessary. When kept in a pen where they cannot be frightened by dogs, strangers or noise, they rarely eject the evil-smelling contents of the gland.

Medicines in liquid form may be easily given through a stomach tube passed through the centre of a conical mouth gag, the apex of which, when fixed in the mouth, points towards the pharynx.

Eczema occurs in all species. It is better to treat it with greasy preparations of a soothing nature. If necessary, the attacked part may be freed of hair by clipping.

Sarcoptic mange often prevails in foxes, the fitch and other mustelids, nutria, musk rat and other species. In mustelids such as ferrets and the fitch the principal lesions are on the feet and nails, when it is popularly termed "foot-rot." During the warmer weather the affected area should be clipped and in mustelids the nails also cut and scraped. Sulphur oil, well-rubbed into the skin (especially that covering the ears and head) twice a week for three weeks, usually completes a cure. Thorough cleansing and disinfection of the floors, boxes, brushes, etc., is necessary to prevent reinfestation. All animals should be treated simultaneously.

Follicular mange sometimes attacks the various species. Treatment as for the dog is necessary.

Parasitic canker is frequent in silver foxes, the ferret, fitch and other mustelids. It often gives rise to nervous disturbance such as hysteria, rolling or pivoting or other movements of the body. All animals in the establishment should be treated at the same time. Recovery is rapidly brought about by dropping into the ear cavity a small quantity of glycerin containing pure carbolic acid and iodine, manipulating the root of the ear between thoumb and forefinger a few times and then wiping away the superfluous dressing with a piece of cotton wool. If this is done every three or four days for three or four times a recovery is obtained. The surroundings should be thoroughly disinfested to destroy any straggling mites. In my experience the parasite of the ferret or fitch is conveyable to the dog, fox and cat and *vice versa*.

Parasites.—There are many species of ecto- and endo-parasites in the various species of animals. Some are injurious and others are beneficial. In a state of nature animals are rarely free of some form of parasites, many of which are only dangerous when in large numbers or when their hosts are not fed sufficiently well.

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DISEASES OF FUR-BEARING ANIMALS BRED IN CAPTIVITY IN THIS COUNTRY*

T. DALLING, M.R.C.V.S.

I shall confine my remarks to diseases of which I have actually had experience during the past two years and intend to deal with two animals only—the fitch and the fox.

Fitch

At one time it looked as if the fitch-raising industry in this country would assume large proportions. At the present time the industry has fallen to a low ebb, but that is no reason why diseases of the fitch should not be studied and methods elaborated for their prevention and control.

In my experience the fitch is liable to be affected with several diseases of an infectious nature, the most important of which is caused by the *virus found in association with canine distemper.* Laidlaw and Dunkin showed very clearly that the ferret was susceptible to canine virus distemper and, as you know, their observations proved an enormous boon in connection with the work on distemper. These authors have given clear and lucid descriptions of the symptoms, course, etc., of the disease in the ferret,

* Paper presented in opening a discussion on "The Fur-bearing Animals Bred for Commerce in Great Britain," by the Central Veterinary Society, May 3rd, 1934.

and I published an article in the *The Veterinary Record* some time ago in which I described the disease in the fitch and showed that the findings of Laidlaw and Dunkin concerning distemper in the ferret applied equally to the fitch. I have seen large outbreaks of virus distemper among fitch, and in most cases the mortality reached practically one hundred per cent. I have seen occasional recoveries, but on the whole, they are rare, though occasionally in big establishments after the disease has been running some time a percentage of immune animals may be found. The incubation period of the disease may vary somewhat, depending on the intensity of the infection. As a rule, if the virulence of the virus is at all severe the incubation period is about 9-12 days, but I have seen outbreaks in which it has been delayed for well over a fortnight. In artificially infected animals this delay is very noticeable when the virus has been stored for some time before injection. The symptoms presented by the fitch are very constant. Confirmation of clinical observations can be obtained by sub-inoculation of spleen into susceptible ferrets and by the application of the complement fixation test.

In my experience, treatment of affected fitch is of no avail. Prevention should be aimed at. Again, following the findings of Laidlaw and Dunkin we have shown conclusively that an active immunity can be established by the injection of a dose of vaccine followed by virus, both of ferret origin. Such immunity seems to be solid and lasting. I have not convinced myself that hyperimmune serum of canine origin will do any good in the treatment of the animals showing symptoms, though large doses may be useful in preventing infection in in-contact animals. Much depends on the time when the serum is injected during the incubation period.

Another disease giving rise to a considerable amount of trouble is *Coccidiosis of the young fitch.* I have seen quite a number of outbreaks and have experienced this disease among fitch in our own breeding establishment. The disease may affect fitch still being suckled though the bitch may be entirely unaffected. As a rule, however, the disease makes its presence felt in the young fitch soon after they have been weaned. The evacuation of fæces stained with blood or almost entirely composed of blood should guide one in a diagnosis. Sudden deaths are quite common, though I have seen affected fitch live for several days after showing symptoms during which time emaciation becomes marked. An examination of the intestinal contents or of a scraping of the intestinal mucous membrane will usually reveal numerous oöcysts. I know of no treatment and in my opinion the best method of prevention is to practice the removal of all litter and scrupulous cleanliness daily.

A further condition of fitch which I have met is *tuberculosis*. Dunkin recorded a case some time ago in a ferret. We had rather a serious outbreak among both fitch and ferrets a year or two ago. The disease was intestinal in origin and lesions were found in most of the abdominal organs. The most interesting feature of the outbreak was that we were able to trace the source of infection to the milk being fed to the animals. I recorded tuberculosis in two pigs fed on milk—the ferret and fitch trouble was part of the same outbreak—the sources of infection being the same milk. Since we started feeding milk from our own tuberculin tested cattle we have experienced no further trouble. We proved the type of tubercle bacilli to be bovine.

These are some of the outbreaks of disease with which I am acquainted. From some work I have done I am convinced that other epidemics may arise, but I am not yet in a position to make any authoritative statement.

Fox

The fox-raising industry in this country is quite extensive—silvers and blues being the most common. We have had opportunity of dealing with outbreaks of disease in several fox ranches and it is of these that I would now speak.

Leptospiral jaundice is, in my experience, one of the most infectious diseases of the fox. I have seen quite a number of outbreaks in both silvers and blues. Dunkin recorded the disease in a wild fox some time ago and Miss Catchpole, writing in *Fur Farming*, gave an excellent description of the disease as it affects foxes in captivity. As in the case of dogs, it is not always easy to demonstrate the presence of the parasite in the tissues, but if the carcase be available very soon after death they may be demonstrated in the liver, etc., either by direct microscopic examination or by inoculation of guinea-pigs. It seems very probable that the source of infection is the " carrier rat," as in the case of dogs. As a rule, young foxes are mostly affected and a sudden death may be the the first indication that anything is wrong. The description of the disease as seen in dogs applies equally to the fox. In some cases little or no actual icterus is seen, especially if the affected fox dies suddenly, but in most cases the general icteric condition is very pronounced. The course of the disease varies considerably, but in my experience affected animals do not live for more than a day or two. Rapid loss of flesh may occur, especially if the animals live even for a day or two after showing symptoms. The *post-mortem* appearances resemble closely those seen in the dog. The " butterfly " condition of the lungs is usually well marked and, in my opinion, is diagnostic. Hæmorrhages in the stomach and intestine varying in extent are usually found. Veterinary surgeons in fox farming districts practise methods of immunisation annually on

many farms. The use of vaccine (2 doses) is quite widely practised and, as far as field experience goes, the results are satisfactory. When a case of the disease appears on a fox ranch and my advice is asked I recommend the injection of all the in-contact foxes with serum and the immunisation of the others with vaccine. The in-contact fox cubs should, of course, be actively immunised in about three weeks' time. In my experience, even large doses of serum injected into actually affected animals may do little good unless the case is seen very early and the serum is injected intravenously.

I have seen *tuberculosis* in the fox. Again the disease proved to be intestinal in form—the mesenteric glands being mostly involved. The type was bovine and in all probability the source of infection was milk, for I found the cow supplying milk for the cubs to be a rather advanced case of tuberculosis. I remember I tried some intradermal tuberculin testing on that ranch, but I could not convince myself that I had obtained any positive reactions.

In a fox imported from Canada *coccidiosis* was found. The fox died and the parasites were quite easily demonstrated in the intestine and in the intestinal mucous membrane. The affected fox simply became emaciated, showed very loose motions and after about a fortnight's illness, died. Though several foxes were in-contact we were never able to show that any other cases occurred.

The fox bred in captivity is susceptible to *distemper of virus origin.* As far as I know, no natural outbreak has occurred in this country, but in Canada reports show that the disease may appear in severe epidemic form. We carried out a rather lengthy research into the disease and found that after a considerable amount of trouble it was possible to infect foxes with distemper virus of canine and ferret origin. Once the infection is started in the fox it seems fairly easy to infect fox from fox, and dog and ferret from fox. The indications we obtained were that it seems possible that methods of prevention on the lines of the immunisation of dogs could be elaborated.

These are a few of the diseases of foxes. From work done in America there appears to be quite a number more and from my own limited experience I feel that if more research could be carried out we might be able to show the existence of diseases which we merely suspect at the moment. I perhaps ought to have said one word on worm infestation, but although such infestations exist and may give rise to serious trouble, the methods of sanitation practised to-day seem to be sufficient control.

The pathology of fur-bearing animal diseases requires a lot more work. The time will come when we shall understand the various diseases better than we do to-day and in this respect I feel that as canine pathology becomes better understood, much of it can be applied to various fur-bearing animals, especially the fox.

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Discussion

Mr. J. W. H. Holmes said that as no one else appeared to be anxious to start the discussion on the interesting papers they had heard, he proposed to make one or two remarks. He had read the article, to which Mr. Henry Gray referred, published by Sir John McFadyean in *The Journal of Comparative Pathology,* and in which the lesions of sarcoptic mange in foxes sent for *post-mortem* were described. Mr. Gray had spoken of the condition as seen in the living animal, ad he would like to ask him about the dressing employed and whether he practised clipping the animal prior to dressing. Mr. Gray mentioned that the period of treatment was the same as that in the dog, and that seemed a rather remarkable result if clipping were not carried out. Finally he would ask him, was the parasite always the sarcopt or did one meet with the notœdres in mange in these fur-bearing animals?

Mr. Henry Gray, in reply, said that, so far as his experience went, one did meet with the notœdres parasite in some of the smaller furred animals, such as the musk rat. In practice, however, their primary concern was not to name the parasite but to get rid of it, and if they dressed the animal with any sound parasiticide they would cure it. In dog mange the sarcopt was sometimes difficult to find—one of his late assistants took 18 scrapings before he could discover it, and was of opinion that if one scraped every dog with skin disease one would find the demodex in the majority. He (Mr. Henry Gray) had found that the best way to cure demodectic mange was to feed the animal well with raw meat and give crude medicinal cod-liver oil, administering injections of neosalvarsan, stovarsol, cacodylate of soda, etc.; if there were pustules these should be opened and the interior of the abscesses washed with a solution of zinc chloride. A dog with mange should never be washed, and as for clipping, if one dressed a closely-clipped dog the dressing did not stay on him long. One had to pay particular attention to the edge of the ears.

Major H. Kirk: "Did I undertand correctly, that Mr. Gray said that demodectic mange is curable?"

Mr. Gray replied that that was so: demodectic mange was not a contagious disease. He looked upon the *Demodex folliculorum* as only doing damage when the animal was in reduced condition, due to improper nutrition. If you wished to kill the affected, wash them. The parasites of the dog were only harmful when the animal was not properly fed.

Mr. J. McCunn said that he would ask Dr. Hare to tell them, if he could, the technique or details of that "simple operation for removing the anal glands of the skunk," because they were often called upon to do that operation in dogs. It was an operation that, personally, he dreaded, for the reason that he was never very sure what result he was going to get.

He desired to ask one other question—this of Mr. Gray—and it was in connection with so-called hydrothorax, which, to his mind, was becoming an increasingly common condition in the dog. Did Mr. Gray's experience coincide with his, *viz.,* that in almost 100 per cent. of these cases the condition of hydrothorax was tuberculous in origin?

Mr. Gray replied that at one time he thought hydrothorax in the dog was of tuberculous origin, but further experience had shown him that it was not: it was due to affection of the kidney and liver and heart. As a rule, one would see an entirely different picture in the tuberculous animal.

Capt. R. J. Stow expressed his appreciation of the contributions made by the openers of the discussion, and added that he desired to ask Dr. Hare two questions: could he tell them the period of gestation in the fox, and what was the normal temperature of fur-bearing animals?

The Replies

Dr. Tom Hare in reply, said that the removal of the anal glands was performed by Canadian farmers to eliminate the offensive odour of the skunk and fitch. He had no personal experience of it; he was relying entirely upon the literature. The operation consisted essentially of an incision on either side of the anus across the gland, which appeared like a pea beneath the fascia; this was snicked and the gland enucleated. It appeared from the literature to be a simple operation; the Canadians did not use an anæsthetic. He had no knowledge as to whether the farmers in this country desired the operation; if it should be desired he hoped the operation would be performed under anæsthesia by a veterinary surgeon.

Proceeding, Dr. Hare said that his main purpose in going about amongst fur-farmers during the last five or six years had been to try and gain their interest and confidence so that they would call on the services of veterinary surgeons in cases of illness in their animals. It was Mr. Henry Gray who first gave him the idea. He had found that fur-farmers were a keen body of people on the whole; most of them were well educated men and women who were really anxious to get expert veterinary assistance. But, as he had mentioned on a previous occasion, they were somewhat diffident in stepping forward and meeting the profession. However, there were some signs of movement in the right direction, *e.g.*, Miss A. M. Catchpole, M.R.C.V.S., daughter of the author of the standard book on the silver fox, recently had been appointed Veterinary Adviser to the fur farmers' journal, *Fur Farming*. As Major Dalling had reminded them, Miss Catchpole was writing a number of instructive articles on disease for the guidance of the fur farmers, and they were very highly appreciated. She also answered queries on feeding and hygiene. Another encouraging sign was the fact that fur farmers had already invited the help of laboratories in outbreaks of contagious disease.

Dr. Hare said he wished again to emphasise that fur farming was in the experimental stage, and that now was the time our profession should step in and help the fur farmers. They were making mistakes, *e.g.*, in feeding, but he would not be so dogmatic as Mr. Gray. In the wild state these carnivorous fur animals varied their dietary; it was not confined to flesh and bones. Also, there were difficulties confronting the farmer which Mr. Gray had not taken into consideration, *e.g.*, the cost of plant. Some of these farms cost thousands of pounds to build and equip. A fox-farmer, at his start, must have three or four pairs of animals for which he would have to pay from three to four hundred pounds. Then there was the heavy cost of food; the cost of feeding raw beef alone, was prohibitive. Consequently, farmers were doing what had been practised for years in hunt kennels; *viz.*, feeding a large proportion of cereal, mixed with gravy. Our dieteticians might take up this problem and select a dietary which would maintain the good health of the stock and yet be within the means of the farmer.

He shared with Mr. Gray the hope that veterinary surgeons would make contact with these fur farmers. There were some very fine farms in Kent, on Dartmoor, in Surrey, near Edinburgh, in Ayrshire and some farther north. They should also make contact with members of the rabbit industry, which was now of great importance. He hoped the Society would have a discussion on the rabbit in health and disease at one of its coming meetings. Yet another important live-stock industry and fancy required their services —*viz.*, the breeding of cage and aviary birds.

He grieved that the profession made the most serious mistake of its history in the way it treated the poultry people—let them take that as an example of what they must not do now and in the future. They should try to help all these animal and bird breeders. The profession was now having to struggle to win back the position in poultry work which it might have had as a free gift twenty years ago.

For the last six years he had been teaching some seventy to eighty students a year about disease in farm animals, fur animals, birds, poultry, etc., and helping them to appreciate the variety of veterinary practice of the very near future. While some of their elder members would not be prepared to take up new ideas and new patients, yet he would ask them to encourage the younger graduates to do so; the demand for specialising in practice became more insistent year by year.

Dr. Hare concluded by expressing the hope that the older members of the profession would do all that was in their power to promote friendship and understanding with these new live-stock industries and to encourage the younger graduates to develop the practice which awaited them.

Mr. Henry Gray said that he quite agreed with Dr. Hare's remarks concerning the younger members of the profession seeking employment outside the usual rut of things. He remembered that when he entered the profession fifty years ago the average veterinary surgeon felt insulted if he were asked to look at a cat or a dog; nowadays he was only too glad to get them as patients, and it would be the same with fur farming and poultry farming. This was about the only country which was passive in these matters.

He thought that the young women in the profession should take a course of poultry husbandry, make a special study of the diseases of poultry and take the places of those who now held the position of poultry instructors, doing the work for which they were best suited. The poultry industry in this country exceeded thirty-three million pounds in value, and it ought to be more; the great drawback to it was disease. It was the same with the rabbit. The sum invested in rabbits amounted to many thousands of pounds, and here again all the people wanted the veterinary surgeon to assist them when they were in trouble. Members of the profession ought to encourage people to employ them, and the younger members should join animal societies, get amongst their members and gain their confidence. It was not laborious work, and there was much sentiment attached to it. If people were willing to pay them as much for attending a pet rat as for attending a horse they ought to do so; it was less trouble.

The Veterinary Record

June 16th, 1934.

PRACTICE IN FURRED AND FEATHERED LIVE-STOCK

Through the enterprise of the Central Veterinary Society the profession has been introduced to the potentialities of veterinary practice among live-stock which hitherto has not been included within our definition of "domesticated animal." Last year, the Society surveyed the composition and requirements of the fur and feather industries and fancies, which have developed during the past decade into great undertakings with central governing bodies, their own press and considerable financial influence (see, *Veterinary Record*, 1933. *13*. 625). This year, as reported in our present number, the Society considered in more detail one aspect of the fur animal industry of Great Britain. We associate ourselves with the hope, which was expressed by several Fellows, that the Society in the near future will promote discussions on the rabbit industry and upon the many wealthy organisations concerned with pigeons, game-birds and aviary-birds. Furthermore, we hope that other divisions of the N.V.M.A. will provide their members with opportunities of debating, during the next session, the potentialities of veterinary practice among these animals and birds.

In one of the articles in this issue to which reference is made above, Dr. Tom Hare describes certain work which he has been carrying out for some years relative to the problems and needs of the breeders and fanciers of furred and feathered live-stock. He has reported that all of these organisations are expanding in numbers and in influence, that losses from disease in their stock are the greatest obstacle to their progress, and that they are beginning to appreciate the need for assistance from an instructed veterinary profession. From the discussions there appeared to be agreement with Dr. Hare's view that private practice, supported by our professional journals, our schools and research laboratories, is the most effective and enduring method of supplying this need. If they have the will to do so, private practitioners can adapt themselves to these new patients and secure the success which has attended their services to the farm animals, dog and cat. No paper scheme organised by the governing bodies of our profession and of the industries will have any practical effect so long as the willing veterinary practitioner and the breeders in his district are personally unknown to, and unappreciated by, one another. Our first task is to gain the goodwill of breeders and of their local societies by establishing personal contact.

Annotation

THE PRESENT SYSTEM OF MILK PRODUCTION AND SUPPLY*

In this first section of the Report the present system of milk production and supply is reviewed. The economic value of the dairy industry is emphasised by quoting the following relevant statistics for 1931. In that year there were 2,763,000 cows and heifers in milking herds and 481,000 heifers in calf, but not in milk, distributed among 200,000 herds in Great Britain. 1,425,500,000 gallons of milk were produced, which at 10¾d. per gallon has a value, on the farm, of nearly £64,000,000. It is estimated that there is, in addition, an annual loss of approximately £3,000,000 due to the fact that the average productive life of dairy cattle under present conditions is only four and a half years instead of the eight or nine lactations that should be expected from a cow that escapes the ravages of disease. This estimate does not allow for the probable increase in the milk yield per cow that would follow the elimination of disease.

A statistical table is given on the causes, said by farmers to be responsible for their losses, covering 17,247 disposals from herds containing in the aggregate 78,905 animals. The percentages of the disposals due to the various causes were as follows: Sterility 23·8, abortion 3, udder disease 7·7, tuberculosis, Johne's disease and wasting 9·7, death and miscellaneous diseases 10·4, tuberculin test 3·6, old age 4·3, accident 1·5, low milk yield 17·7, and trade purposes 18·3. These figures, although striking and giving some idea of the losses due to disease, yet do little more than emphasize the urgent necessity for an extensive statistical enquiry based upon the skilled diagnoses of veterinarians. The results of such an enquiry should be of great value to animal husbandry. Reference is made to the unanimity among experienced veterinarians that four diseases are pre-eminently responsible for the farmers' losses, namely, contagious abortion, bovine tuberculosis, mastitis and Johne's disease.

In discussing the influences affecting the spread of disease among dairy cattle it is pointed out that a cow producing a thousand gallons of milk a year, in addition to supporting a growing fœtus, is making unnaturally severe demands upon her powers of assimilation. In such circumstances quite minor deficiencies in diet may have serious results. Owing to this heavy strain to which they are subject, dairy cows are liable to fall easy victims to disease; in fact, the high incidence of disease among them, the Committee thinks, is closely related to

* An annotation on the first section of the 1934 Report of the Cattle Diseases Committee of the Economic Advisory Council.

this fact. Moreover, the modern tendency to require a constant increase in yield is likely to increase the incidence of disease. Some answer to this question might be given, now that there is a number of cows producing two thousand gallons a year, by a statistical examination of the health records of a sufficiently large number of 500 gallon cows, 1,000 gallon cows and 2,000 gallon cows.

The importance of housing conditions, methods of management and the introduction of cattle from outside as a means of spreading disease is discussed and it is concluded that by far the most important part in preventing infection must be taken by the farmer himself. Emphasis is also laid upon the extensive movements of cattle which take place normally in Great Britain, a factor which must considerably influence the spread of disease.

Methods of Milk Distribution.—Milk may be sold loose or in bottles; it may or may not undergo a number of processes such as filtering, cooling and heat treatment; it may be transported great distances before sale, or it may be consumed at the point of production. The large combines of big towns usually get much of their milk from a considerable distance; local collecting stations are established in which the milk is cooled, cleaned and bulked, the bulked milk is transported in 3,000 gallon glass-lined tanks and then submitted to some form of heat treatment at the consuming centre. This milk is either sold retail in bottles or wholesale in bulk.

The producer-retailer often sells his milk unbottled in the immediate neighbourhood of his farm, usually without submitting it to any process, except in some cases, cooling. The number of producer-retailers is approximately 50,000, and that of producers selling by wholesale contract, approximately 78,000.

W. R. W.

Abstracts

[The Incidence of Tubercle Bacilli and *Brucella abortus* in Milk. Pullinger, E. J. (1934), Research Institute in Animal Pathology, Royal Veterinary College. *The Lancet, 1.* 18. 967-971.]

References to the work of previous observers are given in this article.

Bulk milk was examined for contamination with tubercle bacilli and *Br. abortus* by the guinea-pig inoculation test, the inoculum including the deposit from 100 c.c. of milk and 1 c.c. of gravity cream. An incubation period of six weeks was generally allowed. At autopsy, smears were examined for acid-fast bacilli, and the spleen and regional lymphatic glands were cultured for tubercle bacilli. Blood serum was tested for specific agglutinins of *Br. abortus*, and the spleen was cultured for this organism.

One hundred and one samples of certified and Grade A (T.T.) milk were examined from 45 herds. Of these samples, one [Grade A (T.T.)] contained tubercle bacilli and 70 *Br. abortus*. Sixty-three samples of raw milk from as many as 3,000-gallon rail tanks were examined; all of these samples contained living tubercle bacilli, whilst 53 of them were contaminated with living *Br. abortus*. Sixty-three corresponding samples after pasteurisation by the low-temperature holder process were free from these contaminants.

The extensive contamination of milk bulked in large quantities in a rail tank is probably due to admixture of milk from relatively few cows, perhaps one or two, with tuberculosis of the udder. In two cases out of three, milk from tuberculous udders could be diluted one million times with normal milk without infectivity for the guinea-pig being lost.

Out of 105 samples from ordinary herds in Cheshire, 22 contained tubercle bacilli and 39 *Br. abortus*; whilst out of 104 samples from similar herds in Somerset, two contained tubercle bacilli and 20 *Br. abortus*.

Losses, amongst inoculated guinea-pigs, from intercurrent infections varied between two and 12 per cent., depending upon the class of milk inoculated. The use of duplicate guinea-pigs is recommended. It was found that the success of the guinea-pig inoculation test for the demonstration of *Br. abortus* depended largely upon the class of milk inoculated. In the case of graded milk, contamination with this organism could generally be demonstrated with guinea-pigs either by the agglutination test or by culture, and the use of guinea-pigs gave far more reliable results than the whey agglutination test. With non-graded milk, on the other hand, the whey agglutination test was as sensitive as guinea-pig inoculation. It was frequently impossible to cultivate this organism from guinea-pigs inoculated with milk, though agglutinins were present in their blood.

It should be noted that milk samples from 25 of the tuberculin-tested herds were examined on three occasions and from six of them on two occasions; they were, therefore, subjected to a much more severe test than the ordinary herds, milk samples of which were examined once only. This extremely low incidence of tubercle bacilli in milk from tuberculin-tested herds is an illustration of the value of veterinary control under the present regulations. It should be emphasised that the apparently greater incidence of *Br. abortus* in the milk from graded herds is due to the higher sensitiveness of the guinea-pig test, when applied to milk with a low bacterial count.

The higher incidence of tubercle bacilli in milk from Cheshire may be due to a somewhat higher

general disease incidence in this county, owing to the denser cow population. The Cheshire herds examined were, however, larger on the average than those in Somerset, and this may have been a contributory factor.

The observations recorded in the article emphasise among other things the imperative need for an extensive campaign for eradicating these diseases. In the meantime, efficient pasteurisation can be relied on to destroy tubercle bacilli and *Br. abortus* in milk. F. C. M.

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[**The Conditions Necessary for the Successful Eradication of the Disease Contagious Abortion in Cattle with the assistance of regularly repeated Examinations of the Blood.** Viriden, P. (1933.) (Summary in English.) *Meddelanden frau Statens veterinärbakteriologiska anstalt. 107.*]

Some essential variations in the course of contagious abortion in cattle have been met with during the process of application of the stamping-out method (based on repeated serological examinations) both in newly-infected herds and in herds in which the infection has long been established. While, in the former, measures destined to combat the infection cannot be observed too strictly, it would appear that, in the latter, less importance attaches to them while the cattle are kept housed. During the grazing period, however, in respect to both classes, it is of the utmost importance that there should be no neglect in the observance of the necessary measures of security, otherwise rapid and extensive spread of the infection is inevitable.

In newly-infected herds the taking of blood samples must, on every occasion, embrace the entire herd and must also be repeated at intervals not longer than a month until two successive examinations of the blood show the herd to be free from infection. In such herds, all cattle revealed by the agglutination test to be infected, must be permanently removed from the herd: one of the four herds under investigation had been freed from infection, but was infected anew through re-admittance of animals which had been infected but which, later on, recovered. Such animals are not infrequently carriers of infection. W. B.

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[**Diagnosis in Contagious Abortion. Results of the Examination of One Thousand Cases of Abortion.** Plum, N. *Saertryk of Maaneds skrift for Drylaegar.* Bd. XLV. 1933. (Summary in German).

The investigation comprised the examination of placental tissue and blood from 1,000 cows that had aborted—material sent to the laboratory by the consulting veterinary surgeons.

A. In all cases the following examination was undertaken: (1) microscopical examination of preparations stained with Giemsa and Ziehl-Neelsen for the demonstration of *Br. abortus, M. tuberculosis,* Spirilla and pathogenic fungi; (2) microscopical examination of scrapings of cotyledons after treatment with glycerin, for the detection of pathogenic fungi; (3) cultural work on malt medium to detect presence of fungi; (4) Holth's antigen test. Deviation of complement for the demonstration of *Br. abortus* (using placental extract as antigen). The blood was examined for evidence of *Br. abortus* infection by complement deviation and by agglutination. The values established in this way are represented on pages 323 and 324. The figures over the line show the agglutination titre, and those under the line the result of the complement deviation test. Agglutination in ·02 c.c. and complement deviation in ·05 were regarded as positive.

B. Further, in every case the clinical history furnished by the veterinarian and the naked-eye appearance of the placenta on its arrival at the laboratory, were compared with the final results of the examination. Six hundred and seventeen placentæ were examined both by the veterinarian and at the laboratory. The results were as follows: 186 cases were regarded by the veterinarian as very suspicious of abortion—further examination confirmed the diagnosis in 108 cases; 431 cases were not considered suspicious of infection by the veterinary surgeons—of these, infection was diagnosed in 86 cases; in 202 cases the naked-eye appearances at the laboratory suggested abortus infection, which was confirmed in 128 cases; 415 cases which showed no microscopic abnormality at the laboratory yielded 81 positive for contagious abortion.

C. Of the entire series of placental membranes (1,000) macroscopically examined at the laboratory, 327 were found to be abnormal. Further examination of these showed *Br. abortus* infection in 200 cases, with 26 cases of other infections, namely, tuberculosis 7 cases, spiral organisms 10 cases and 9 cases of infection with pathogenic fungi.

On the other hand, in the naked-eye examination of the series 673 placental membranes showed no visible or suspicious lesions. Further examination of these, however, demonstrated 143 cases of *Br. abortus* infection, five of tuberculosis, eleven of spirilla infection and pathogenic fungi in four cases.

D. *Br. abortus* infection was encountered in 343 cases, or 34 per cent. of the series. The various methods employed yielded the following results: microscopical examination of preparations stained by Giemsa gave positive results in 259 cases (75 per cent.)—this method gave a mistaken diagnosis in a single case; by Holth's method (antigen test) 325 cases were positive,

which included 13 cases in which the micro-organism could not be found—in 18 cases of undoubted infection this test proved negative.

The blood tests.—Of the above 343 cases, two showed no complement deviation material and nine samples contained no agglutinin. In 18 others the agglutination titres were so low that they could not be regarded as positive.

E. Tuberculosis was established in twelve cases and spirilla infection in 21 cases. Aspergillus or mucor infection occurred in 13 cases (*Aspergillus fumigatus* 8; *Asp. flavus* 1; *Absidia ramosa* 1; *Abs. lichtheimi* 1; *Asp. fumigatus* and *Abs. ramosa* together 1). In addition, by cultural work on placental material, in 160 cases were various fungi grown. It must be assumed, however, that after the act of abortion there is ample opportunity for contamination of the membranes. A review of fungi types found is given in page 332.

F. From various causes a definite diagnosis could not be established in 26 cases.

G. The result of this investigation shows that the methods ordinarily employed in the diagnosis of contagious abortion at the Serum Laboratory (where the above investigation was conducted) *i.e.,* microscopic examination and agglutination, will discover almost all positive cases. An enlarged technique embracing Holth's antigen test and clinical history had the effect of increasing the reliability of diagnosis by only one per cent.

W. L. S.

* * * * *

[**Fatal Snake Bites in the Pig.** (Trans. title.) Henry (1934.) *Recueil de Méd. Vét. de l'Ecole d'Alfort. 110.* 3, pp. 129-131.]

The author calls the attention of veterinarians to the fact that pigs are not really refractory to snake bite as was previously generally thought to be the case, and that bites of these reptiles when inflicted in certain parts of the body may cause poisoning or even death.

It is known that certain mammals are naturally resistant to snake bite and this is often said of the pig—so much so that in districts in which vipers occur pigs are sometimes extolled for control measures, it being known that they eat them readily. (An old reference (1841) is quoted concerning the wonderful eating qualities of young pigs fed exclusively on vipers).

In his book "Les Venims" Calmette doubted any immunity, but explained the apparent resistence of the pig to its protection by the presence of a layer of fat under the skin, with little vascularity, causing slow absorption of the venom. No anti-venom could be demonstrated in pig's blood.

Collaine wondered if the thickness and toughness of its skin and hairs or the thickness and insensibility of its fat mechanically protected the pig.

Russel cites a case of recovery after illness in a pig bitten by an undetermined snake, but the latter had already reduced its venom by striking several times previously.

Brazil thinks that only in the wild state will the pig, having an intense struggle for existence, attack reptiles for its food. He quotes an instance in which, after fasting it for 48 hours, he placed a pig with a rattle-snake which struck several times without apparent effect, but the pig did not attack the snake. This confirms the pig's resistance.

Finally, proof of resistance was apparently obtained by Billard. He produced an anti-toxic substance against viper venom in a guinea-pig by the use of the autolytic juice of pig's liver.

On the contrary, the following case suggests non-resistance of the pig.

An owner lost two pigs suddenly with considerable œdema of the head and body. Knowing vipers were infesting the neighbourhood, he looked for and found marks of snake bites just above the groin where a plentiful vascularity permitted rapid absorption of the venom. The owner thought the vipers were attracted by the skim-milk fed to the pigs.

C. V. W.

* * * * *

[**Parturition Methods in the Sow.** (Trans title.) Engelein, A. (1933.) (Thesis. Faculty Vét. Méd. Leipzig University.)

In the introduction the author refers to the various aspects of parturition in the pig, laying stress on those factors which he believes predispose to difficulty and make assistance necessary, such as—service at too early an age, poor condition of the sows as the result of bad feeding, housing and general management.

On the peasant farms where most of the cases recorded occurred the conditions were exceptionally bad as the result of poverty and any attempt at asepsis was impossible.

The literature, consisting of thirty references, is reviewed, attention being paid more particularly to the type of instruments used and the drugs employed. The succeeding section deals briefly with all the abnormalities which may be encountered, *e.g.,* anatomical abnormalities, tortio uteri, exostoses, œdema, necrosis, mummification. Six plates are given showing clearly the three instruments used by the author and how these are applied to the fœtus, either singly or in combination. These are: (1) a long pair of forceps with toothed ends by means of which traction may be applied to the nose or limb; (2) a simple long-handled hook; (3) a steel rod with a looped extremity which serves to tighten up a looped cord when the free ends are passed through it and drawn tight.

N. S. B.

Report

CIVIL VETERINARY DEPARTMENT, PUNJAB

Report for the Year 1932-33*

The report is a comprehensive and illuminating record of a valuable and active department's activities and contains some interesting illustrations. It is submitted to Government by Mr. Quirke, the Director of Veterinary Services, who was in charge for part of the year under report. During his absence on six months' leave, Mr. Taylor officiated, and both these officers earned the thanks of Government "for the admirable manner in which the affairs of the Department were conducted."

Breeding Operations.—This important branch of the Department's activities receives prominent notice and is rightly regarded by Government as very valuable.

During the year 490 stud bulls were supplied to District Boards from the Hissar Farm which carries some 8,000 head of stock of various kinds. In addition to bulls, 10 donkey stallions, 3 Arab stallions, 21 male goats, 10 female goats, 129 rams, and 22 ewes were issued. Goats and sheep are important products in many parts of the Province and selective breeding is essential to progress.

Cattle breeding on grantee cattle farms and in selected districts is fully dealt with in the report and provides an instructive and interesting record of progress. Experimental work at the Hissar Farm is a feature of the report. The stimulation of fertility in cows by using the urine of pregnant animals gave encouraging results, which will be published separately.

The comparative rate of growth of wool from month to month in sheep is being determined and results are to be published.

Experiments were successfully concluded on "Sunflower" (*Helianthus annuus*) as a fodder crop, proving that it can be cultivated throughout the year.

Warble infestation was dealt with by periodical dressings of lime and tobacco, and encouring results were obtained.

Camel breeding received attention in certain districts and progress is reported. Cattle and horse fairs and shows were regularly attended by officers of the Department. They numbered 108, a decrease on last year owing to paucity of funds and the prevalence of contagious diseases. One-day cattle shows are being fostered and becoming popular.

Prevention and Treatment of Disease.—The year was not a healthy one. Rinderpest accounted for 53 per cent. of the total mortality in bovines and is stated to occur in definite cycles. Hæmorrhagic septicæmia was next in importance, there being extensive outbreaks in certain areas. In equines 12 cases of glanders were reported. Surra was rather widespread among equines and camels in low-lying areas, and 2,126 cases were treated at the various surra centres very successfully.

Preventive treatment in connection with cattle disease was largely practised with serum and vaccines, some 500,000 animals being inoculated. Two hundred fowls were vaccinated against fowl cholera.

There were 293 veterinary hospitals at work during the year, at which 1,208,500 animals were treated. The number of villages visited by the district staff on tour was 56,493, and 440,299 animals were treated. Over 200,000 castrations were performed on tour and over 250,000 in veterinary hospitals during the year.

PUNJAB VETERINARY COLLEGE.

During Mr. Taylor's absence Capt. Walker officiated as Principal. The number of students was 100 and there were 10 admissions, all of whom possessed University intermediate qualifications. The check in the expansion of the Department's activities by economic difficulties has reacted on the popularity of the Veterinary College as an avenue to a professional career and is commented upon by Government. A more adequate staff for the Department and further development is forecasted, however, and it is surmised that applications will increase. The average daily attendance of patients at the College Hospital amounted to 166 and 177 *post-mortem* examinations were conducted. One hundred and seventy-seven skiagrams were taken for the hospital clinic and 147 gallons of electrolytic chlorine were prepared for use in the hospital. Four hundred and sixty-five pathological and 441 parasitological specimens were examined. Forty-one samples of milk were reported upon.

Veterinary Research.—At the Veterinary College important work in an attempt to perfect the method of protection against rinderpest was conducted in collaboration with the Imperial Institute at Muktesar, with encouraging results.

Experiments in connection with the toxic effects of certain vegetable poisons and indigenous drugs are being conducted. A new sanitary and disinfectant fluid has been prepared for trial in the College. Propaganda work received marked attention and the *Punjab Veterinary Journal* continues to flourish.

Department Staff employed.—In addition to the Director, Mr. Quirke, 5 superintendents, 4 assistant superintendents, and 13 deputy superintendents were employed in the districts, including the Hissar Farm. Eleven officers, including the Principal, Mr. Taylor, were engaged at the College. The subordinate staff consisted of 13 inspectors, 66 veterinary assistant surgeons, and 281 veterinary assistants. G. K. W.

* High Commissioner for India, Aldwych, London, W.C.2. Three shillings.

Review

[Les Actinomyces du Groupe Albus. Jacques Duche. *Encylopèdie Mycologique.* Vol. VI. Paul Lechevalier et Fils. Paris, 1934. 377 pages, 20 figures, 4 plates. Price 100 fr.]

Although the saprophytic group of actinomyces dealt with in this volume is chiefly of importance to the soil biologist, the author has touched upon various points of interest to workers who are more particularly concerned with those members of the genus which cause disease in the higher animals.

The book opens with an historical survey of the development of knowledge regarding the Actinomyces in general, followed by a critical review of the generic names and methods of classification which have from time to time been proposed. Added to this is an extensive bibliography of over 60 pages which is a valuable feature of the work.

The author proceeds to analyse the causes which have led to confusion as to the identity and inter-relationship of the numerous species or types which have been described and to indicate the methods which should be employed in studying the properties of these organisms. Special stress is laid on the necessity of working with strains derived from single spores which should be cultivated under uniform conditions on media of known composition (synthetic media).

After reviewing the various species which have been assigned to the albus group, the author gives a detailed account of the properties of pure type strains maintained in the collection of the Museum d'Histoire Naturelle, which should prove of real value to other workers for purposes of comparison.

LINNEAN SOCIETY'S GOLD MEDALLIST

Sir Sidney Harmer, formerly director of the Natural History Departments of the British Museum and the champion of the whale against the depredations of commercialism, was on May 24th, presented with the gold medal of the Linnean Society.

Professor F. E. Weiss, president of the Society, in presenting the medal, said that Sir Sidney Harmer's literary and practical services to zoology had brought him high distinction. Referring to the New Whale Gallery in the Natural History Museum, he said that Sir Sidney was to be congratulated on persuading those responsible to provide accommodation for his somewhat cumbersome specimens. It required a big man, he concluded, to be the protector of leviathans.

Sir Sidney Harmer said that his interest in whales had been primarily due to a desire to do something to save them from the destruction and extermination which threatened them.

Dr. William Thomas Calman, Keeper of Zoology in the British Museum of Natural History, has been elected President of the Linnean Society in succession to Professor F. E. Weiss.

N.V.M.A. Divisional Reports

CENTRAL VETERINARY SOCIETY

Fur-bearing Animals discussed at the Conway Hall

After a considerable interval, the Society returned to the subject of the fur-bearing animals, their management, diseases and treatment, at the May meeting held at the Conway Hall, Red Lion Square, W.C.1, on the third of the month, the openers of the discussion being Dr. Tom Hare, Mr. Henry Gray and Major T. Dalling.

The Chair was occupied by the President (Mr. H. C. P. King), and, in addition to the Fellows already mentioned, there were present Lieut.-Colonel E. P. Argyle, Captain L. S. Balls, Mr. W. Brown, Captain R. E. C. Bullen, Mr. H. E. Bywater (Hon. Secretary), Major W. Denington, Miss C. M. Ford, Mr. C. Formston, Lieut.-Colonel H. Greenfield, Colonel H. E. Gibbs, Messrs. S. L. Hignett, R. E. Holmans, J. W. H. Holmes, L. Hughes, Major Hamilton Kirk, Miss B. L. Lock, Professor Jas. Macqueen, Captain G. Dunlop Martin, Professor J. McCunn, Captain J. F. Macdonald, Mr. J. W. McIntosh, Lieut.-Colonel W. S. Mulvey, Mr. W. Perryman, Miss M. Stewart, Captain R. J. Stow, Major F. J. Taylor and Mr. R. A. Willett. The following were present as visitors: Messrs. C. E. Adams, R. Chesney, A. M. B. Copithorne, Misses Evelyn and Violet Gray, M. Levie, Messrs. T. J. Maguire, N. Merlen, H. Moloney, Misses P. Peake, R. Race and P. Vanda, Mr. O. Uvarov and Miss D. Williams.

The minutes of the previous meeting had not yet been published, and their presentation was accordingly deferred.

Correspondence.—(1) From Major-General Sir John Moore, Mr. H. L. Roberts and Professor G. H. Wooldridge, apologising for inability to attend the meeting.

(2) From Mr. S. J. Edwards, intimating his resignation upon his appointment to the Hannah Dairy Research Institute. On the proposition of Mr. Holmes, seconded by Dr. McCunn, Mr. Edwards's resignation was accepted with regret and the Secretary was directed to send him a message from the Society wishing him well in his new appointment.

(3) From the Secretary of the Royal College of Veterinary Surgeons concerning the Library Endowment Fund appeal. In the course of this letter it was stated that an endowment fund was desired for the College Library in order that the Library Service might be developed to the fullest extent. It was acknowledged that the Library was performing a most important function in the advancement of veterinary science and the hope was expressed, therefore, that the Society would see its way to make a generous grant to the fund.

Mr. McIntosh said that he thought that the Society should not pass that letter by without making some observations upon it. In his view they should make some contribution towards the Endowment Fund of the Library.

The Hon. Secretary said that in answer to that, he thought it was officially a question for the Council of the Society to deal with as it involved the expenditure of their funds, and that, therefore, it would come up in due course at the next meeting of the Council.

Mr. McIntosh observed that he thought that the Council would desire an expression of opinion from that meeting. Accordingly he proposed that the Central Veterinary Society instruct the Council to subscribe to the Central Library Fund of the Royal College.

Major Kirk seconded the proposition, which was carried unanimously.

Elections.—There were no nominations, but the following were elected to Fellowship: Mr. J. H. L. Addis, Albion House, Newbury, Berks (Proposer, Mr. R. E. C. Bullen, Seconder, Professor G. H. Wooldridge); Miss M. M. Lane, 55, Ashbourne Avenue, Golders Green, N.W.11, (Proposer, Major R. F. Wall; Seconder, the Hon. Secretary); Mr. G. W. Searles, West Street, Alresford, Hants. (Proposer, Mr. R. E. C. Bullen; Seconder, Professor G. H. Wooldridge).

Summer Meeting.—It was decided to postpone to the next meeting the question of the desirability of holding a Summer Meeting, and its venue.

MORBID SPECIMENS AND CASES OF INTEREST

Captain R. J. Stow exhibited the two first molar teeth from the upper jaw of a fox terrier just under three years old. The teeth were affected with caries and he thought it was rather a peculiar coincidence that this should occur in both teeth at once. Near the right tooth was an abscess, just under the eye, which was on the point of bursting and which did so when he removed the tooth.

Captain L. S. Balls recounted a case of interest which had occurred that morning. The subject was a valuable Yorkshire terrier which had had several bitches taken to him to be lined, but did not line any of them. On examining the dog he found the os penis to be curved. He could not find any sign of the bone having been fractured. He wondered whether any other member of the Society had met with such a condition.

Miss B. L. Lock said that the previous week she was called out to a doe that had been ill for some time. The owner thought that it had a chill and when she (the speaker) examined it she was rather at a loss to know what to do. However, she made a routine examination and when she was feeling its abdomen it struck her that the bladder was enormously distended. She thought that the case was one of retention of urine and she tried to relieve it by pressure. Nothing happened, but when she shifted her hand a little further back she found a small hard body about the size of a hazel nut. Her assistant then handled the doe somewhat more firmly and the bladder ruptured, when it was found that there was a urinary calculus.

The President said that he would like to record a rather interesting case: the occurrence of purpura hæmorrhagica in a bay gelding, three years running—1932-3-4. He had never known it to occur previously more than once in the same animal, and he would like to know whether any other Fellow had known it to do so.

Mr. Henry Gray thought that there was a case recorded in *The Journal of Comparative Pathology and Therapeutics,* some years ago, where a horse had purpura hæmorrhagica five or six times, eventually dying from the condition.

The Hon. Secretary said that he remembered seeing a case in a baker's van horse which occurred three years running, the condition invariably shewing itself in the early part of the summer just after the animal was allowed out to grass. At the fourth year before it was allowed to graze it was put on a course of iron and the condition did not recur.

Mr. R. A. Willett observed that as they had several veterinary surgeons present who were acquainted with disease in other than the domesticated animals, it might be of interest to them to know that he was called upon recently to make a *post-mortem* on an elephant that died suddenly. Another veterinary surgeon was with him and they both came to the conclusion that the *post-mortem* lesions very closely resembled those of hæmorrhagica septicæmia. He would be very glad to know from anyone who had knowledge of the condition, whether the elephant did suffer from true hæmorrhagica septicæmia. On the *post-mortem* certificate he did state that the condition of the elephant resembled hæmorrhagic septicæmia, but further than that he was not prepared to go.

Discussion.—There being no further contributions to the morbid specimen and interesting case section, the President called upon Dr. Tom Hare to open the discussion on the fur-bearing animals bred for commerce in Great Britain by presenting his contribution, entitled: "Fur-bearing Animals and their management." Mr. Henry Gray followed, dealing with the diseases of these animals and treatment, while Major T. Dalling, who wound up for the openers, concerned himself largely with distemper and leptospiral jaundice. The subsequent general discussion was disappointingly brief—a fact which served, however, to lend additional point to Dr. Hare's concluding plea, in reply, that veterinarians should concern themselves more seriously with this relatively new and increasingly important aspect of their work and should do their utmost to meet

the needs of those engaged in the very valuable home fur-raising industry. [All this material constitutes the opening feature of this issue of *The Veterinary Record*—Ed.]

At the termination of the above discussion, the President proposed a very hearty vote of thanks to the three openers. This was warmly accorded and, there being no other business, the proceedings closed with the payment of a similar tribute to the President for his conduct of the proceedings.

H. E. Bywater, *Hon. Secretary.*

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YORKSHIRE VETERINARY MEDICAL SOCIETY*

PROFESSOR WRIGHT'S DEMONSTRATION AT LEEDS

A general meeting of this Society was held on April 27th, 1934, at the Veterinary Department premises of the Leeds City Corporation, when the chief interest of the agenda was the presence of Professor J. G. Wright, of the Royal Veterinary College, who carried out a demonstration of surgery and anæsthesia.

Supporting the President (Mr. A. H. Watson) there were present 25 members, together with the following visitors: Miss Sparks, Messrs. J. O. Powley, J. Ritchie and W. A. Milligan. Professor Wright was accompanied by his assistant, Mr. J. S. Paterson. Apologies for absence were intimated from Messrs. A. W. Noel Pillers, A. J. McCarmick and D. S. Rabagliati.

Demonstration

The operations carried out by Professor Wright consisted of ovariotomy in the cat and relief of a large inguinal hernia in a female cat. This latter subject was in a late stage of pregnancy, the large gravid uterus being herniated. The condition was treated by the performance of metrectomy and closure (as far as possible) of the hiatus. Owing to malfunction of the sterilising apparatus the further operations which it was hoped to carry out were not proceeded with. Other subjects present were chronic sepsis of the anal glands in a dog and chronic otorrhœa in the dog, and Professor Wright discussed the treatment of these cases. In a short address, Professor Wright brought out the main points required in carrying out successful surgery and indicated the increased prestige acquired by the practitioner who did not neglect surgical practice. In a discussion which followed, in which Messrs. W. R McKinna, S. E. Sampson and F. C. Scott participated, the value of nembutal as a narcotic was stressed, and information as to its indications and uses was given by Professor Wright, who said that details as to dosage would shortly be published in *The Veterinary Record.*

A vote of thanks to Professor Wright for attending the meeting and giving so illuminating a demonstration and address, and to his assistant, Mr. Paterson, was moved from the Chair, and was enthusiastically carried by the meeting.

Business Meeting.

A short business meeting was then held.

After confirmation of the minutes, the following monetary grants were made:—One guinea subscription to the National Horse Association and five guineas to the Library Endowment Fund of the R.C.V.S.

The following were elected to represent the Division on the Council of the N.V.M.A.:—Lieut.-Colonel J. A. Dixon and Messrs. W. R. McKinna and D. S. Rabagliati.

Mr. G. Clarke, Bradford, of the Ministry of Agriculture, was elected a member on the proposition of Mr. A. H. Watson, seconded by Mr. E. F. McCleery; Mr. W. A. Milligan and Mr. J. Ritchie were nominated for membership by Mr. W. T. McGregor.

The Secretary moved that a vote of thanks be passed to Colonel Dixon and Mr. McCleery for the services which they had rendered in placing such a suitable site at the disposal of the Division for the meeting and for the efforts they had made in carrying out the arrangements. This vote of thanks was duly accorded.

S. Sharp, *Hon. Secretary.*

* Received for publication, May 5th.

SIR FREDERICK HOBDAY AND THE SHEFFIELD BRANCH OF THE R.S.P.C.A.

The pioneer part taken by Sheffield in the adoption of methods for the humane slaughter of animals was highly praised by Sir Frederick Hobday, Principal of the Royal Veterinary College, London, at the annual meeting of the Sheffield branch of the Royal Society for the Prevention of Cruelty to Animals, presided over by the Lord Mayor (Alderman Fred Marshall) at the Town Hall, Sheffield.

Sheffield had greatly helped to lead the way to the general use of humane methods of slaughtering animals, said Sir Frederick. He specially congratulated Mr. W. Tweed (Chief Veterinary Officer, Sheffield Corporation) and his colleagues upon methods adopted locally for the killing of pigs and sheep. He also referred to an electrical method of slaughter invented by Mr. Tweed for use with the larger animals. This method, he said, was certainly the best he had ever seen, for it was simple, cheap and effective, the animal being rendered unconscious within a fraction of a second. He thought it would be adopted all over England.

Sir Frederick praised the work done by the Sheffield branch of the R.S.P.C.A. in arranging for sick animals of poor persons to receive proper and skilled attention, and expressed his pleasure that members of the veterinary profession in Sheffield were assisting in the scheme.

EDINBURGH*

"We entered Edinburgh in the dark, through mean, narrow streets, the aspect of which, by the faint light of dim lamps ill accorded with the magnificent promises of the splendour of the proud metropolis of the whole earth—of the capital of social elegance, and of perfect refinement.

I remained for the night at the wretched inn where the coach stopped, for I knew of no other, although it was a disgusting place. Nobody appeared to regard me. I didn't understand what they said; neither could I make the people understand me.

If such be, in very deed, the beauteous city of Minerva, the chosen residence of Apollo and the Muses, the true abode of Beauty, of the Loves and Graces, I wish I were back again at my lodgings in York, or at one of the inns near the Lakes, which tourists report as comfortable! But a sound refreshing sleep soon put an end to all reflections, wishes, and regrets. . . . When I awoke in the morning, it was quite light. . . . I put on my clothes, and went downstairs into a common room, an uncommonly dirty, dingy hole; here I procured some breakfast, which was not so much amiss. I then sallied forth to discover if the rest of the New Jerusalem was as mean and shabby as what I had already seen; I more than half suspected that it was. I soon emerged from the narrow streets; and then, O! glorious spectacle, by force of contrast made still more noble, more glorious; I wandered about, lost in admiration."

Thomas Jefferson Hogg.
"The Life of Percy Bysshe Shelley"
1811.

* Meeting place of Congress, N.V.M.A., July 30th—August 3rd, 1934.

IN PARLIAMENT

Milk Bill Debate

On the order for the second reading of the Milk Bill, in the House of Commons on June 7th, Mr. Walter Elliot, the Minister for Agriculture, said that the main objective of the measure was to increase the consumption of clean liquid milk in this country and to build that upon public confidence in the purity of the milk supply and to hold the position while these two campaigns were getting under way by the advances for manufacturing milk. It was unnecessary to argue the case for the first two proposals—increase in consumption and the cleaning up of herds—but he gathered from amendments put down that certain exception was taken to the advances for manufacturing milk and to the rate at which the Government were proceeding with the campaign for cleaning up the herds.

The financial provisions were necessary if the industry was to be preserved. It was no use demanding a higher quality of milk and looking forward to greater consumption unless the industry was preserved as a going concern. The Minister was empowered, on this foundation, to spend up to £750,000 during a period of four years in such a way as he thought would improve the quality of milk for home consumption. This was to be done in consultation with the Ministry of Health, and Treasury approval had to be obtained. In order that the work should be continued after that time he was empowered to require the boards to continue the campaign without further assistance from the Exchequer. It was the intention to pay sums by way of premium to producers of milk of a defined quality, and the Minister was required to lay particulars of his plans before both Houses of Parliament.

The Bill enabled the Minister of Health to revise the designations of milk and to reduce the number of grades, including the elimination of the present "Grade A," the lowest grade of milk. The Bill also contained provisions for increasing the demand for milk.

It was objected in the reasoned amendment of the Opposition that the Bill failed to make adequate provision for the eradication of disease from cattle. He was assured by his technical advisers that in the provision now being made he was proceeding as rapidly as was reasonable. Their programme for the payment of premiums should bring perhaps a thousand tested herds in the first year, and that number might be considerably increased in subsequent years. The financial provisions made would cover an expansion in the preliminary years at the utmost rate they could hope for under present conditions. A general campaign of slaughter was not possible because of the lack of milk that would ensue. The necessary assurance of continuity of this programme had been secured. By means of the premium they would be able to launch the scheme, but the main work would be done by the organised industry itself, and it was taking the necessary steps to ensure a progressively larger supply of progressively higher quality. He was sure that these were worthy proposals and were flexible and capable of development, and that the House would not regret having started on this road. (Cheers.)

Rejection Moved

Sir S. Cripps moved the following motion:—"That, while this House is of opinion that the wider distribution of a pure and efficient milk supply is an urgent necessity, it cannot assent to the second reading of a Bill which is designed to encourage the production of milk products in preference to an increase in the consumption of fresh milk among the children in public elementary schools and at a price within the reach of the poorer households, and which, in view of the recent Report of the Economic Advisory Council, fails to make adequate provision for the eradication of disease from cattle."

Some hon. members, he said, might not realise how serious even now was the question of impure milk. The matter called for some action far more drastic than that which the Minister was proposing to take. The problem could not be adequately met merely by offering a premium for pure milk. By allocating the comparatively small sum which was allocated, and by refraining from taking powers to deal with the matter, the Minister was not making any effective onslaught on this problem of contaminated milk. This cleaning up must be done nationally, from the centre, and the Minister should take powers similar to those which he had for dealing with

foot-and-mouth disease—the right, if necessary, to condemn tuberculous beasts, but especially the power to isolate, and the right of a central inspection. Going about the country one could see tuberculous cattle, half-starved looking, lean animals which some small man continued to milk.

It was generally agreed that something must be done in existing circumstances to help the dairy industry. In anything that might be done the Minister should take full power to deal with the whole veterinary and disease side of tuberculosis, and, if a subsidy was to be given to the farmers, it should be given in such a way that would enable supplies of liquid milk to get to school children.

Mrs. Ward said that the Bill was the first real attempt on the part of any British Government to clean up the milk supply. It was a genuine effort to give the public clean milk. There were grave dangers in giving milk free to school children, and the House should be able to devise some scheme whereby milk could be provided for all school children without demoralising them or making discrimination. It was not an easy matter and it would take years to clean up our dairy herds, but we must do everything in our power to remove what was the greatest stumbling block to the larger consumption of milk.

The Duchess of Atholl said that she was glad that if there was money to spare it would be spent in attempting to eradicate tuberculosis, but she would rather have seen the sum it was proposed to spend on publicity devoted to the very expensive matter of making herds tubercle-free. Once the medical profession were convinced of the danger of infection publicity would come of itself.

Mr. Skelton, Under-Secretary for Scotland, replying to the debate, said the theory that the same result could be obtained from the money which the House was being asked to vote by using it for giving milk to school children instead of in the way proposed under the Bill was based on a fallacy. The Government was being invited to concentrate its expenditure almost entirely on the supply of milk to school children. The Government's proposals were a wiser and balanced policy because, while not neglecting this point, they kept in mind that milk was the raw material of several important industries.

The motion for the rejection was negatived by 190 votes to 47—Government majority, 143, and the Bill was read a second time and committed to a Committee of the whole House.

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The following are among the questions and answers recorded in the House of Commons since the Whitsuntide Recess:—

Bracken

Mr. Henderson Stewart asked the Secretary of State for Scotland if any steps are being taken in the present season to deal with the increasing loss of sheep stock and grazing land brought about by the spread of bracken?

The Secretary of State for Scotland (Sir Godfrey Collins): The committee which has been actively investigating the possibility of improving existing methods of eradicating bracken are proceeding with their inquiries, and have arranged for demonstrations of different methods to be given in the course of the present month. I hope to receive a report from them on the result of their investigations as soon as possible thereafter.

Mr. Stewart: Is it intended to publish the report in view of its importance to the sheep-farming industry of Scotland?

Sir G. Collins: It will depend on the character of the report and whether a satisfactory method has been found.

Sir R. Hamilton: Have the Government considered offering a reward or devising a scheme for dealing with this matter?

Sir G. Collins: We have chosen a body of scientific and practical men and have asked them to apply their minds to this matter, and I think the report we shall receive will throw further light on a difficult question.

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Cruelty to Animals and Birds (Punishment)

Mr. Clyde Wilson asked the Home Secretary whether his attention has been drawn to a case at Dorchester on Saturday, May 26th last, in which two men received the maximum sentence of three months' imprisonment, with hard labour, for cruelty to a chicken by tearing off its wings and breaking its legs, the bird being still alive when found in this condition; whether, in view of the frequency of such cases of gross cruelty, he will consider introducing legislation to enable a heavier penalty to be inflicted; and whether he has any statement to make?

Mr. Hacking: I have seen a news report of the case referred to. Such cases are happily less frequent than in the past and my right hon. Friend does not see his way to introduce legislation in the sense suggested.

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Tuberculosis Order, 1925.

Captain Heilgers asked the Minister of Agriculture if he will state the amount paid in compensation for animals slaughtered under the Tuberculosis Order of 1925 for the year 1933?

Mr. Elliot: The total sum paid in compensation for animals slaughtered under the Order in 1933 was £71.827.

Mr. Kirkwood: Is it the policy of the Government to slaughter all tuberculous cattle?

Mr. Elliot: It is the policy to slaughter those that come under this Order.

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Milk Advisory Committee

Mr. Leonard asked the Minister of Agriculture what were the terms of reference given to the Milk Advisory Committee and the date of their last meeting; and whether he proposes to consult this committee in respect of the milk marketing schemes now functioning?

Mr. Elliot: The terms of reference to the committee which was appointed in 1924 were as follow:—

"To advise the Ministry of Health and the Ministry of Agriculture and Fisheries on matters concerning the production, handling and distribution of milk and dairy produce, including questions relating to education and research, and any legislation, orders and regulations which may be under consideration."

The date of the committee's last meeting was April 13th, 1928. The answer to the last part of the question is in the negative.

Mr. Leonard: As the Committee contains representatives of the medical profession. will the right hon. Gentleman consider bringing it together for the purpose of giving him guidance as to the proposals now being prepared to give cheap milk to education authorities?

Mr. Elliot: There are representatives of so many interests on the Committee that we can

never get a unanimous recommendation on anything.

Mr. Kirkwood: Is the right hon. Gentleman satisfied that this Committee is functioning in the interests of the people at the moment?

Mr. Elliot: No, Sir. I think it might be said that the committee has faded out.

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Earl Haig Statue

Lieut.-Colonel Moore asked the First Commissioner of Works if he will state the present position in regard to the Earl Haig memorial statue; whether he is satisfied with the progress made; and when it is anticipated the statue will be completed and erected?

Mr. Ormsby-Gore: The full size model in clay is nearly completed, and I have no reason to be dissatisfied with the progress made. My hon. and gallant Friend will realise that in matters of this kind it is not always possible to adhere rigidly to a pre-arranged programme. Consequently, I am not in a position at present to say when the monument will be erected.

Sir William Davison: May I ask whether the llama-like neck of the charger in the original sketch, to which exception was taken by many people, has been reduced, so that the neck of the horse will be more in character with that of an ordinary charger?

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

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DIARY OF EVENTS

June 20th.—Meeting of the Western Counties Division, N.V.M.A., at Plymouth.

June 20th.—Meeting of the Lincolnshire and District Division, N.V.M.A., at Peterborough.

June 25th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

June 27th.—Annual Summer Meeting of the Lancashire Division, N.V.M.A., at Southport.

June 28th.—Meeting of the Dumfries and Galloway Division, N.V.M.A., at Appleby.

July 2nd.—Membership Examination Fees due.

July 2nd.—N.V.M.A. Committee Meetings.

July 3rd.—N.V.M.A. Committee and **Council** Meetings.

July 4th.—R.C.V.S. Committee Meetings.

July 5th.—R.C.V.S. Committee Meetings.

July 6th.—R.C.V.S. Committee and **Council** Meetings.

July 9th.—Membership Written Examination.

July 11th.—Membership Oral Examinations begin.

July 30th-Aug. 3rd, 1934.—National Veterinary Medical Association Congress, Edinburgh.

Aug. 13th-18th, 1934.—Twelfth International Veterinary Congress, New York.

Aug. 24th.—Entries due for Jubilee Memorial Bursary Examination.

Sept. 24th-25th.—Examination for award of Jubilee Memorial Bursary.

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REPORTS OF CLINICAL CASES

It has been decided to offer payment to recorders of clinical articles published in *The Veterinary Record.*

It is suggested that, wherever possible, the adoption of a uniform method of recording cases is desirable, and the following is issued as a guide for the recording of clinical cases for publication.

Records should be as complete as possible, concise, and written in the third person. Photographs, radiographs, sketches and diagrams should be submitted if advantageous.

When describing lesions, dimensions should be indicated as far as possible by measurements, or by comparison with common objects.

SUBJECT.—**Age, sex and breed. In the case of cross-bred small animals—approximate bodyweight.**

HISTORY.—**Duration of disease. History of in-contacts. Nature of onset and course. Diet. Previous medical history.**

EXAMINATION.—**Eyes, ears, skin, mouth and teeth. Limbs and action. Thorax, abdomen, urinary and genital tracts. Examination of urine, fæces, discharges, skin scrapings.**

DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS.

PROGNOSIS.

TREATMENT.—**In surgical cases details of anæsthesia and operation.**

COURSE OF DISEASE—OUTCOME.

POST-MORTEM EXAMINATION.—**Record should be comprehensive and findings carefully described.**

DISCUSSION.

Payment for published articles is at the rate of 10s. a column.

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N.V.M.A. CLINICAL PRIZE SCHEME FOR STUDENTS

It is confidently anticipated that the 1934 entry for the above, interest in which showed distinct signs of revival last year, will reach a record number. Certainly the obligation now laid upon veterinary students to "produce to the Examiners their case-books recording the cases they have seen during a period of not less than six months' clinical instruction under a recognised extra-mural teacher" should encourage participation in the scheme, and now that the Long Vacation is approaching, students are urged to make up their minds to take advantage of this additional inducement to practise the fine art of case-recording.

THE WALLASEY APPOINTMENT

As the official organ of the N.V.M.A., we may perhaps be excused some measure of gratification in drawing attention to the appearance in our advertisement columns of an announcement from the County Borough of Wallasey inviting applications for the post of veterinary officer at a salary of £600 per annum. This Council contemplated appointing a veterinary surgeon at a salary of £450, but as a result of representations made by the Association, this figure has been increased to one which accords with the Association's scale of salary for such an appointment. Our appreciation of the action of the Wallasey Borough Council is enhanced by the knowledge that they will now secure a man competent to fill the post.

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R.C.V.S. ANNUAL GENERAL MEETING

Captain Adrian Jones Honoured

In our last issue we published the results of the election to Council of the Royal College of Veterinary Surgeons, the announcement of which formed part of the earlier portion of the proceedings of the Annual General Meeting of the College, held at 1, Red Lion Square, W.C.1, on Thursday of last week.

There was a great improvement in the attendance, as compared with those of recent years, and this was particularly gratifying as the occasion was rendered particularly noteworthy by the presentation of the diploma of Honorary Associate to Captain Adrian Jones, M.V.O., M.R.C.V.S., the sculptor of the Quadriga on Constitution Hill and many other well-known equestrian works, and who is still "in harness" as a sculptor, although he is 90 years of age. Captain Adrian Jones was present to receive the diploma, and made delightful and vigorous acknowledgment of the honour.

The J. H. Steel Memorial Gold Medal was presented to Professor J. B. Buxton, the president of the College, for outstanding work in the interests of the veterinary profession.

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PERSONAL

On Leave.—The following Colonial Service veterinary officers arrived on leave from the Colonies and Protectorates during the month of May: Messrs. F. H. Manley (Cyprus), N. Clarke (Nigeria), H. Idenden (Palestine) and H. M. Salusbury (Tanganyika Territory).

Professor Share Jones Honoured.—The University of Berne has conferred an honorary doctorate on Professor Share Jones, Director of Veterinary Studies at Liverpool University, at its centenary celebrations. The grounds announced for the conferment of the degree were that he had "changed and enlarged the conception of veterinary science, created for it new opportunities for service, and advanced the cause of university education."

The Late Mr. Holliday

In the course of an appreciative notice of the late Mr. Holliday, whose death was reported in our last issue, *The Cumberland and Westmorland Herald*, says: "The passing of Mr. Holliday removes one of the best-known personages in a wide area centred on the Eden Valley and the eastern fellsides. For a period of considerably over half a century his profession as a veterinary surgeon had brought him into contact with the agricultural community far and wide. Despite his being over 82 years of age Mr. Holliday's strength and activity were the envy of people who were many years his junior and he followed his profession up to late in the evening of Easter Monday, when he attended what proved to be his last case at Milburn. On the following morning (April 3rd) as Mr. Holliday was rising from bed he had a seizure, and, despite every attention, he was unable to leave his bed again.

Mr. Holliday was born at Smithfield, in North Cumberland, in 1851, and excepting for short periods when he followed his profession in Dumfries, Manchester and Haltwhistle, he has practised all his life in his native county.

Although as a young man he was interested in wrestling, and in later years occasionally acted as judge at local wrestling matches, his sole interest in life was his profession. He has held many positions, including that of local veterinary inspector to both the Cumberland and Westmorland County Councils.

In recognition of his services during the war period, at a large gathering held at the George Hotel, Penrith, fourteen years ago, Mr. and Mrs. Holliday were presented with a gold watch, chain and pendant, silver tea and coffee service, illuminated address and a cheque for a large amount from farmers and other friends of Cumberland and Westmorland and district.

The farming community within a radius of many miles paid impressive tribute to their late friend and helper at the funeral. So large was the attendance that many were unable to find accommodation in the church.

Those present included three of Mr. Holliday's fellow veterinary surgeons: Messrs. W. Scott, Penrith; O. Stinson, Appleby (representing the Galloway and Dumfries Division of the N.V.M.A., of which division he is president); and S. Taylor, Kirkoswald.

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SIR WALTER FLETCHER MEMORIAL

An opportunity is announced for those who desire to participate in a tribute to the memory of Sir Walter Fletcher, the first secretary of the Medical Research Council, who died in June of last year, and at the height of those powers which he used without stint in the service of science and of mankind.

It is considered that the tribute should consist in the first place of a personal memorial, and secondly of the inception of some scheme for the furtherance of the cause which Sir Walter Fletcher had so much at heart. It is therefore proposed first to commission a portrait bust, to be placed in a suitable setting in the entrance hall of the National Institute for Medical Research at Hampstead. The remainder of the sum collected will then be used as a fund for building—at the farm premises of the National Institute at Mill Hill—a Walter Fletcher Laboratory, to be devoted particularly to those nutritional studies in which he was so keenly interested. This will not only provide an appropriate memorial, but it will make

an urgently needed contribution to the national equipment for work in what is at present among the most important of all branches of medical research. All subscriptions should be sent to the Secretary, Fletcher Memorial Fund, 38, Old Queen Street, Westminster, S.W.1.

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COLONEL COMMANDANT, R.A.V.C.

The announcement is made in *The London Gazette* (June 1st) that, as from May 24th, Major-General W. S. Anthony, C.B., C.M.G., is appointed Colonel Commandant Royal Army Veterinary Corps *vice* Major-General Sir John Moore, K.C.M.G., C.B., F.R.C.V.S., who has attained the age limit for the appointment.

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HARPER ADAMS POULTRY CONFERENCE

Through the Association's Advisory Committee on Poultry Diseases, the Principal of the Harper Adams Agricultural College extends to members of the profession a cordial invitation to attend the Annual Poultry Conference which opens at the College, Newport, Shropshire, on Tuesday, August 14th.

Limited accommodation is available in the College, and those desirous of taking advantage of it are advised to make immediate application to the Principal.

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MEDICAL APPLICATIONS OF "DOWSING"

In a paper on the application of "dowsing" (water divining) to medicine, delivered on the occasion of the first annual conference of the British Society of Dowsers, Dr. D. D. A. Wright, of London, said that this branch of divining arose out of the discovery that it was possible to estimate the percentage of salts in any specimen of water by holding in the hand a sample containing known quantities of salts, while testing with the rod and pendulum. It was but one step further to test water for bacterial contamination and then to test the bodies of men and animals for germ infection. Since the establishment of this practice many workers, especially in France, had investigated it and exploited it for the diagnosis of diseases, and in some cases for the selection of remedies.

One of those who had rendered service to the cause of radio-physical diagnosis, Dr. Abel Martin, had the diploma of Doctor of Veterinary Science conferred on him in 1932 by the University of Paris for a thesis in which he cited examples of diseases in horses, cattle, and sheep diagnosed by means of the pendulum. Dr. Wright said that Dr. Martin's procedure was as follows:—The pendulum was held in one hand by its cord, and the other hand was held out horizontally, pointing at the animal under examination. This hand acted as an antenna or aerial. If the animal were perfectly healthy the pendulum would gyrate in the hand in an anti-clockwise direction. With a sick animal there was a clock-wise gyration for all the healthy parts but an oscillation when the unhealthy parts were pointed at.

Dr. Martin diagnosed certain infections, and in several cases of food poisoning he was not only able to diagnose the disease as one of that nature, but by testing specimens of the various foods supplied to the animals to ascertain which particular store of hay, oats, or clover was the source of the poisoning.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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CARIES OF THE TEETH OF ANIMALS

To the Editor of The Veterinary Record.

Sir,—Would you allow me to contribute a few observations on dental caries to your issue which records the interesting exhibit before the Central Veterinary Society by Captain Roger Stow, M.R.C.V.S., of two carious teeth from a three years old terrier.

Caries of the teeth is found occasionally in horses and dogs; it is exceptionally infrequent in cattle, sheep and swine. It has not been recorded in the domesticated cat or in other members of the felidæ. Malze (1914), estimated that 0·12 per cent. of the dogs attending the Berlin clinic were affected with caries. Of approximately 50,000 patients admitted in the five years 1927-32 to the Royal Veterinary College Hospital my clinical colleagues reported only three cases of caries (in dogs). About 30 years ago, Sir Frank Colyer found carious teeth in 66 out of 484 skulls of London horses (*vide* his "Abnormal Conditions of the Teeth of Animals in their Relationship to Similar Conditions in Man," published by the Dental Board of the United Kingdom, London, 1931). Sir Frank has very kindly permitted me to examine some of these specimens, which are now exhibited in the Museum of the Royal College of Surgeons, and I have formed the opinion that some of them were examples of the very common pit-like defects of the crown, "enamel-folds" or "enamel-pits," and were not true caries. For a special investigation, ten years ago, I examined in detail the teeth at autopsy of 146 town working horses without discovering one case of caries; in fact, I have yet to find my first case of equine caries in the *post-mortem* room. Probably the present rarity of equine caries in city veterinary practice is due to the large diminution in the horse population during the past 20 years and not to any decrease in the percentage incidence of the disease. Sir Frank has also found dental caries in wild primates, carnivora, rodentia, ungulata and marsupialia, so that it is untrue to regard caries as essentially due to civilisation (in man) or domestication (in animals).

In animals, dental caries usually commences in early mature life; it does not appear to have been found in deciduous teeth. The lesion, which may originate in the enamel, denture or cement, has been described macroscopically and microscopically by Joest (Handbuch d. speziellen path. Anat. der Haust., Band I., Berlin, 1926). The process and results of the disease in the animal's tooth are analogous to those in the human tooth.

Veterinary literature merely records whatever speculation on the etiology of dental caries is fashionable in human dental practice; Miller's theory was adopted for many years, but has yet to be verified. To-day many dental authorities assume that caries is a local process occurring in teeth of defective structure. But in animals, defective structure of the teeth (dental hypoplasia or the more widely known "canker" and "discoloured enamel") has long been recognised

as the almost invariable consequence of deficiency disease (*e.g.*, rickets), and of certain infections (*e.g.* distemper) in youth. [By the way, it was this lesion (dental hypoplasia) not caries, which Mrs. May Mellanby produced in her valuable nutrition experiments on puppies (M.R.C. Report No. 140, 1929); Mellanby's experimental disease bears a close resemblance to the natural hypoplasia of cattle "Le Darmons," described by Velu, H. (Archiv. Instit. Pasteur d'Algérie, 1932, *10*, 41.)] Stagnation areas due to irregularities in number, form and position of the teeth and to periodontitis are very common, particularly in dogs and horses; they are not uncommon in cats. Injury to, and loss of, dental tissue are very frequently found in animals; moreover, they are the invariable consequence of common operative procedures, *e.g.*, rasping and shearing of horses' teeth. Thus, in view of one notion prevalent among dental surgeons, I think it necessary to emphasise that in spite of their high incidence, these congenital and acquired structural and environmental defects have not been observed to predispose to caries in domesticated animals.

Sir Frank Colyer found that caries in *captive* animals usually commences in the enamel, whereas in animals in the *feral state* the disease usually commences in the dentine or cement; he attributes the former to unsuitable dietary and the latter to exposure following injury of the tooth. This ingenious speculation based upon original and painstaking observation offers a basis for experimental study.

Stockfleth (1895) and other veterinary writers have suggested that dental caries is inherited. This notion could easily be tested by controlled breeding experiments with dogs.

Despite disagreement over the interpretation of her dog experiments we should acclaim Mrs. May Mellanby's long and patient study of dental caries; it proves conclusively that controlled experimentation is the right method of investigating its etiology. Whatever line is studied (genetical, nutritional or bacteriological) the experimental disease should be compared with natural dental caries of the animal used for the experiments. Since the natural disease is so infrequent in domesticated animals it is to be hoped that all available details of cases observed by your readers will be recorded in your columns and that the specimens will be preserved for research.

I have the honour to be, Sir,
Your obedient Servant,
TOM HARE,

70, Holywell Hill,
St. Albans.

R.C.V.S. Council Election

TO THE EDITOR OF THE VETERINARY RECORD

Sir,—I shall be glad if you will allow me to return my most grateful thanks to those 763 Fellows and Members, R.C.V.S., who recorded their votes in my favour at the recent Election.

Yours faithfully,
J. C. COLEMAN.

Swindon,
June 12th, 1934.

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TO THE EDITOR OF THE VETERINARY RECORD

Sir,—May we express our sincere thanks, through the medium of *The Veterinary Record*, to those members of the profession who so kindly recorded their votes in our favour at the recent Election to Council, R.C.V.S.

Yours faithfully,
H. W. DAWES.
A. MACKENZIE.

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TO THE EDITOR OF THE VETERINARY RECORD

Sir,—Please allow me, through your columns, to thank the 499 men and women in the profession who recorded their votes in my favour at the recent Election to Council, R.C.V.S.

Yours faithfully,
J. T. EDWARDS.

Reidonhurst,
Knaphill,
Woking.
June 11th, 1934.

Diseases of Animals Acts.

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th May, 1934	16	19	1	61	6	6	4	65	38
Corresponding period in									
1933	13	13	—	—	4	4	9	114	70
1932	18	22	—	131	1	2	8	91	46
1931	23	26	—	—	4	4	10	157	67
Total 1st January to 15th May, 1934	185	193	2	92	79	126	316	583	324
Corresponding period in									
1933	143	163	54	5,161	89	162	188	544	266
1932	181	232	3	358	66	117	125	813	377
1931	231	248	5	515	74	124	164	682	282

NOTE.—The figures for the current year are approximate only.

§ Excluding outbreaks in Army Horses.